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ABSTRACT

This basic core curriculum for vocational agriculture education contains 35 units of instruction in five content areas: agricultural chemicals (1 unit), leadership (2 units), farm management (5 units), plant and soil science (10 units), animal science (8 units), and farm mechanics (9 units). Each unit follows a typical format that includes terminal objectives, specific objectives, information sheets, transparency masters, assignment sheets, and a test. (LRA)

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ED201806

Vocational Agriculture II
Curriculum Guide
10th Grade
1980

CE 028 815

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EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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80-133-01

KANSAS VOCATIONAL AGRICULTURE EDUCATION

Basic Core Curriculum

II

FORWORD

This publication is one of a set of four designated as the basic core of instruction for programs of Vocational Agriculture in Kansas. The Kansas Core will provide teachers of Vocational Agriculture with direction in the development and delivery of an instructional program for secondary agricultural students within the state.

Kansas is an agricultural production state. Its economy is dependent upon the ability to produce an abundance of raw agricultural products. The Kansas Core with localized information will provide students with technical information necessary to enter into the business of farming or ranching. The information contained in these publications must be supplemented with a well planned supervised farming program.

Since the majority of the off-farm agricultural occupations are closely associated with production agriculture the Kansas Core properly supplemented with information directly related to the student occupation may serve as a basic core to preparing for an off-farm agricultural occupation. Supervised occupational experience in the student's chosen occupation is a necessary component for an off-farm agricultural education program.

Appreciation is expressed to the Oklahoma State Board of Vocational and Technical Education for permission to adapt the Oklahoma Core to Kansas conditions. Appreciation is also expressed to Dr. Ralph Field, Kansas State University, and the Vocational Agriculture teachers who dedicated their time to adapting the Oklahoma Core to Kansas conditions and to the writing of new units which are included in this publication.

Dean Prochaska
Director Vocational Education

The content of this publication was revised and reviewed by selected Kansas Vocational Agriculture Instructors and KSU College of Engineering and Agricultural faculty.

Agricultural Education Staff
State Department of Education

Les Olsen
Damon Slyter

Agricultural Education Staff
Kansas State University

James Albracht
Earl Baugher
Robert Broeckelman
Marvin Hackmeister
John Parmley
Paul Stevenson
Richard Welton

Appreciation is extended to Fred Sorrells and Kathy Rizer for their contributions.

This publication was prepared under the supervision of Ralph Field, Adult & Occupational Education, Kansas State University.

Materials revised with permission from the Oklahoma State Department of Vocational and Technical Education.

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AGRICULTURAL CHEMICALS
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to interpret the use of agricultural chemicals. The student should be able to list safety precautions and relate them to his or her home and community. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define ten terms associated with agricultural chemicals.
2. List three sources of information regarding the safe handling of agricultural chemicals.
3. Name five items that all chemical labels must state.
4. Explain, in writing, the responsibility of Kansas State University in regard to agricultural chemicals.
5. Name three benefits from using chemicals.
6. Name three disadvantages of using chemicals.
7. Name five major areas of pests.
8. Name economic losses which may occur due to pests.
9. Distinguish between a repellent, stomach poison, and contact insecticide poison.
10. Name three ways chemicals enter the body.
11. List the protective clothing and accessories necessary for the protection of anyone handling chemicals.
12. Discuss three safety precautions before attempting to use chemicals.
13. Name three safety precautions when applying chemicals.
14. Name three safety precautions after using chemicals.
15. Name two methods of disposing of empty chemical containers.
16. List three safety precautions to use in storing chemicals.
17. List and discuss four regulatory procedures involved to apply and/or supply agricultural chemicals.
18. Demonstrate the ability to list the symptoms and first aid practices for acute pesticide poisoning.

AGRICULTURAL CHEMICALS
UNIT I

INFORMATION SHEET

I. Terms and definitions (Transparency 1)

   A. Pesticides - A substance or mixture used for destroying or repelling such pests as insects, rodents, nematodes, weeds, and brush

   B. Nematode - A small roundworm which lives in the soil and frequently enters the plants through the roots

   C. Herbicide - A chemical substance used to kill herbaceous plants

   D. Insecticide - A chemical substance used to kill or repel insects such as flies and grasshoppers

   E. Rodenticide - A chemical substance used to control rats, mice, and other rodents

   F. Defoliant - Any substance or mixture of substances used to cause leaves or foliage to drop from plants, generally to facilitate harvesting

   G. Fungicide - A chemical substance used to control fungi

   H. Antibiotics - Any chemical or chemicals produced by living organisms that help alleviate or control bacterial diseases

   I. Plant regulators - Any substance or mixture of substances that effect, through physiological action, growth rate or other behavior of plants

   J. Poison - A substance which, if introduced into an organism in relatively small amounts, may chemically produce an injurious or deadly effect

   K. Toxicity - The degree a given substance injures plants or animals

   (NOTE: Toxicity is classified as acute (immediate) or chronic (long term).)

   L. LD_{50} - The average lethal dosage of the poisonous substance required to kill 50% of a large population of laboratory animals. (TM 2)

   (NOTE: The lower the LD_{50}, the more toxic the chemical.)

   M. Acute exposure - Refers to inhaling or absorbing of large amounts of chemicals in a short period of time

   N. Chronic exposure - Refers to inhaling or absorbing relatively small amounts of poison over a long duration (days, months, or years)

   O. Absorption - The process whereby the material gains entry into the bloodstream.

   P. Hazard - The danger or probability that injury will result from the use of a substance in a given quantity and manner

- Q. Nematocide - A chemical substance used to control nematodes
- R. Safety - The practical certainty that injury will not result from the use of a given substance

II. Sources of information

- A. Chemical labels (Transparency 3)
- B. Technical publications from chemical firms
- C. State and federal laws and regulations

III. Key items on chemical labels (Transparency 4)

- A. Personal precautions or signal words
    - 1. Poison, skull, and crossbones (hazardous substances)
    - 2. Danger (highly toxic products)
    - 3. Caution or warning (products that can cause illness or injury)
- B. Name and address of manufacturer
- C. Statement of net contents
- D. Ingredients and their effect
- E. Directions for use
- F. Precautionary statements for using
- G. Date of expiration
- H. Antidote
- I. Storage precautions
- J. Disposal of chemical containers

(NOTE: See supplemental information sheet #1.)

IV. University responsibilities with chemicals

- A. Research
- B. Development
- C. Dissemination of inforamtion

V. Benefits of chemicals

- A. Increase production
    - 1. Labor savings
    - 2. Increases profits
- B. Reduce pest loss

C. Control undesirable vegetation
    1. Grass
    2. Broadleaf plants
    3. Brush

D. Defoliant

VI. Disadvantages of using chemicals

A. Pests may become more established following chemical use due to the loss of predators and parasites

B. Non-target organisms may be adversely affected

C. Human poisoning may occur

VII. Major area of pests

A. Weeds

B. Insects

C. Disease
    1. Bacteria
    2. Viruses
    3. Fungi

D. Rodents

E. Nematodes

VIII. Economic losses which may occur due to pests

A. Reduced vigor of plants and animals

B. Decreased yields from crops

C. Decreased production from livestock

D. Lowered quality of crop and livestock products

E. Losses occurring in storage

F. Reduced profits and increased productions costs

G. Damage to buildings and equipment

H. Reduced land values

IX. Types of insecticieds

A. Repellent - Chemicals that do not kill most insects although they may injure certain types

B. Stomach poison - Chemicals that must enter the digestive tract of the insect before they are effective

C. Contact poison - Chemicals that can enter the insect by means other than the digestive tract

X. Methods chemicals enter the body
   A. Absorption through the skin
   B. Swallowing
   C. Absorption by breathing
   D. Absorption through eyes

XI. Types of protective clothing and accessories (Transparency 6)
   A. Rubber golves
   B. Rubber boots
   C. Safety goggles
   D. Breathing apparatus (respirator)
   E. Head protection (cap)
   F. Proper clothing
      1. Rubber apron
      2. Slicker suit

XII. Safety precautions before using chemicals (Transparency 5)
   A. Read labels before using
   B. Use only when necessary
   C. Use according to recommendations
   D. Use recommended preparation and mixing procedures
   E. Avoid sprays and dust drift
   F. Keep away from livestock
   G. Cover feed and water containers when using
   H. Wear appropriate protective clothing
   I. Avoid residue build-up

   (NOTE: All laws and regulations regarding the application and use of chemicals should be studied before use. The responsibilities involved by those recommending and selling chemicals should be understood.

XIII. Safety precautions when applying chemicals
   A. Wear appropriate protective clothing and accessories
   B. Minimize drift by adjusting sprayer equipment
   C. Avoid residue build-up

XIV. Safety rules after using chemicals

- A. Properly dispose of unwanted chemicals
- B. Properly dispose of unwanted chemical containers
- C. Clean the spraying equipment and area
- D. Remove protective clothing and clean up

XV. Disposal of empty containers (Transparency 7)

- A. Burning

  (NOTE: Burn immediately upon completion of job. Do not inhale smoke from fire.)
- B. Burying

XVI. Safety precautions for storage

- A. Store in original containers
- B. Store away from children
- C. Store away from feed
- D. Store in a cool, dry area
- E. Store in locked cabinet
- F. Check stored chemicals periodically

XVII. Regulatory procedures to apply and/or supply agricultural chemicals

- A. Obtain official approval to apply and/or supply agricultural chemicals
  - 1. Applicator's certification
    - a. Required to apply restricted agriclutural chemicals
    - b. Educational training required before certification
    - c. Examination administered by the State Board of Agriculture
    - d. Certificate and certification card given if satisfactory examination score is obtained (TM 1)

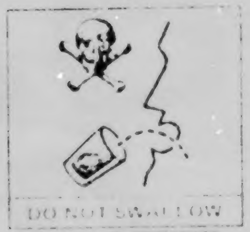
      (NOTE: Certification card must be presented to dealer when purchasing restricted agriclutural chemicals.)
    - e. Private (farmer) and commercial certification issued (TM 2)
  - 2. Operator's license
    - a. Required to supply agricultural chemicals
    - b. Issued by the State Board of Agriculture to dealers
- B. Recognize the responsibilities involved by those recommending and supplying chemicals

1. Insure chemical labels are intact and legible
2. Check for proper certification of customers for chemical being sold
3. Explain application and storage procedures for chemical being sold

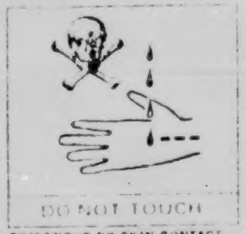
C. Complete and file applicator's records (See Supplemental Information Sheet #2)

D. Complete and file operator's records (See Supplemental Information Sheet #3)

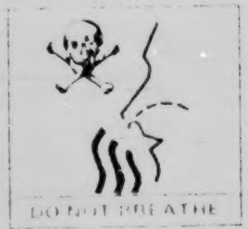
DANGER — POISON — PRECAUTIONS



POISONOUS IF SWALLOWED — This product can kill you if swallowed even in small amounts spray mist or dust may be fatal if swallowed



POISONOUS BY SKIN CONTACT— Poisonous if touched by hands or spilled or splashed on skin, in eyes or on clothing (liquid goes through clothes)



POISONOUS IF BREATHED— Breathing vapors spray mist or dust may be fatal

DANGER

Poisonous if swallowed, inhaled or absorbed through the skin! Rapidly absorbed through the skin or eyes. Do not get in eyes, on skin or on clothing. Do not breathe the spray mist or vapor.
Repeated inhalation or skin contact may, without symptoms, progressively increase susceptibility to methyl parathion poisoning.
Clothing wet with this material must be removed immediately.
Exposed persons must receive prompt medical attention or they may die.
Do not contaminate feed and foodstuffs.
KEEP AWAY FROM HEAT AND OPEN FLAME.

POISONOUS TO FISH AND WILDLIFE

This product is toxic to fish and wildlife. Birds feeding on treated areas may be killed. Keep out of any body of water. Do not apply when weather conditions favor drift from areas treated. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes. APPLY THIS PRODUCT ONLY AS SPECIFIED ON THIS LABEL.

USE ONLY WHEN WEARING THE FOLLOWING PROTECTIVE EQUIPMENT AND CLOTHING

Wear clean natural rubber gloves, waterproof pants, coat, hat, rubber boots or rubber overshoes and safety goggles when handling, mixing or applying this product. Wear a face mask or respirator of a type passed by the U.S. Bureau of Mines for endrin and methyl parathion.

WORK SAFETY RULES

Keep all unprotected persons and children away from treated area where there is danger of drift. Do not rub eyes or mouth with hands. If you feel sick in any way STOP and get help right away. Call a doctor (physician), clinic or hospital—immediately. Explain that the victim has been exposed to methyl parathion and describe his condition. After first aid is given (see First Aid Treatment Section) and if a doctor cannot come, take victim to clinic or hospital.
IMPORTANT! Before removing gloves, wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking.
AFTER WORK take off all work clothes and shoes. Shower, using soap and water. Wear only clean clothes when leaving job. Do not wear contaminated clothing. Wash protective clothing and protective equipment with soap and water after each use. Respirator should be cleaned and filter replaced according to instructions included with respirator.

CONTAINER DISPOSAL

Do not reuse empty containers.
Decontaminate empty containers by rinsing with a solution prepared by mixing 5 gallons of water, 2 pounds of caustic soda (household lye) and 1 cup detergent. Close container openings and rotate container repeatedly until all inner surfaces are thoroughly wet. Bury rinse solution at least 18 inches deep in isolated areas of noncropland away from water surfaces. Crush or perforate container to prevent further use and dispose of by burying with wastes or by burning. (Keep out of smoke.)

NOTICE: Because Velsicol Chemical Corporation has no control over storage, handling, and conditions of use, which are of critical importance, Velsicol Chemical Corporation makes no representation or warranty, either express or implied, for results or residues greater than any tolerance which may be established by appropriate governmental agencies, due to misuse, improper handling or storage of this material. Nor does Velsicol Chemical Corporation assume any responsibility for injury to persons, crops, animals, soil or property arising out of misuse, improper handling or storage of this material.

SP 47

SPECIMEN LABEL

STOP — READ LABEL BEFORE USING!

POISON

See Side Panels
for Antidote &
Precautions

CAN CAUSE DEATH

DANGER

Keep Out of
Reach of
Children

VELSICOL®

ENDRIN-Methyl Parathion

EMULSIFIABLE CONCENTRATE

Contains 1.6 Pounds Endrin and 1.6 Pounds Methyl Parathion per Gallon

ACTIVE INGREDIENTS:	
Endrin*	18.3%
O,O-Dimethyl O-p-nitrophenyl thiophosphate**	18.3%
Petroleum Hydrocarbons	58.4%
INERT INGREDIENTS	5.0%
TOTAL	100.0%

*Hexachloroepoxyoctahydro endo endo dimethanonaphthalene.
**Methyl Parathion.

E.P.A. Reg. No. 876-127-AA

NET CONTENTS:

NOT FOR HOME USE

VELSICOL CHEMICAL CORPORATION 341 East Ohio Street, Chicago Illinois 60611

SUPLEMENTAL INFORMATION SHEET #1

Ag. II - 11-A

KPL-150 SUPPLEMENTAL INFORMATION SHEET #2

Ag. II - 13-A

KANSAS STATE BOARD OF AGRICULTURE

TOPEKA, KANSAS 66603

W. W. Duitsman
Secretary

503 Kansas Avenue
913-296-3556

SPECIAL RESTRICTED USE PERMIT

This form (when properly completed) is considered a special restricted use permit and allows the undersigned to purchase and use the restricted chemical for pest control on designated Kansas acreage.

1. PURCHASER (Landowner or Farm Operator) (Type or Print)

Name ____________________
Address ____________________
City ____________ State ____________
County ____________ Certification No. ____________

* * * * * * * * * * *

2. SELLER (Type or Print)

Business Name ____________________
Business Address ____________________
City ____________ State ____________ Zip ____________

* * * * * * * * * * *

3. If applicator is other than the purchaser, name and certification number of certified applicator who will be applying the chemical under this permit.

Name ____________________ Certification No. ____________

* * * * * * * * * * *

4. County and ASCS Field(s) to be treated and additional information specifying the area within the field to be treated.

COUNTY IN WHICH TREATMENT IS TO BE MADE.	ASCS FIELD(s) #	NO. OF ACRES TO BE TREATED	NUMBER POUNDS APPLIED	NUMBER GALLONS APPLIED
	TOTALS	_____ Acres	_____ Pounds	_____ Gallons

* * * * * * * * * * *

5. LANDOWNER If other than Farm Operator

Name ____________________
Address ____________________
City ____________ State ____________
County ____________ Zip ____________

* * * * * * * * * * *

6. I acknowledge that I have read and understand the restricted chemical labeling, that the chemical will be used in accordance with labeling directions and restrictions only on land specified above, and, if I am not the owner of any fields specified above, that the landowner will be notified of the labeling restrictions. It is further agreed that inspection officials of the Kansas State Board of Agriculture will be allowed access to treated acreage for inspection.

____________________ SIGNATURE OF LANDOWNER OR FARM OPERATOR

____________________ DATE OF PURCHASE

Disposition of Copies:
White and Canary Copies: Mail to Weed and Pesticide Division
Pink Copy: Seller
Goldenrod Copy: Landowner or Farm Operator

SUPPLEMENTAL INFORMATION SHEET #3

KANSAS STATE BOARD OF AGRICULTURE

Ag. II - 15-A

TOPEKA, KANSAS 66612

ENTOMOLOGY DIVISION
H. DEAN GARWOOD, Director
1720 S. Topeka Avenue
(913) 296-3016

W. W. DUITSMAN
Secretary

CHEMICAL USE PERMIT

This form, when properly completed and distributed by the certified commercial pesticide applicator, authorizes said certified commercial applicator to procure and apply the chemical on behalf of the customer listed below in accordance with the specific exemption granted for the use of such pesticide to the Kansas State Board of Agriculture under provisions of Section 18 of the Federal, Insecticide, Fungicide and Rodenticide Act.

PLEASE PRINT

1. Property Owner/Farm Operator

Name: ____________________ Telephone: __________

Address: ____________________

* * * * * * * * * *

2. Location of Treatment

Legal Description or Location: ____________________

County: ____________________ No. of Acres to be Treated: __________

Is this the first ☐ or second ☐ treatment at this location? (check one)

* * * * * * * * * *

3. Pesticide - Amount Purchased with this Application: ____________________

Type (check one)	Supplier (check one)
Ambush 2E ☐	Farmland Industries ☐
Pounce 3.2 EC ☐	Cornbelt Chemical ☐
	Pueblo Chemical ☐

* * * * * * * * * *

4. Applicator(s)

Name(s): ____________________ Certification No.: __________

____________________ Certification No.: __________

Business Address: ____________________

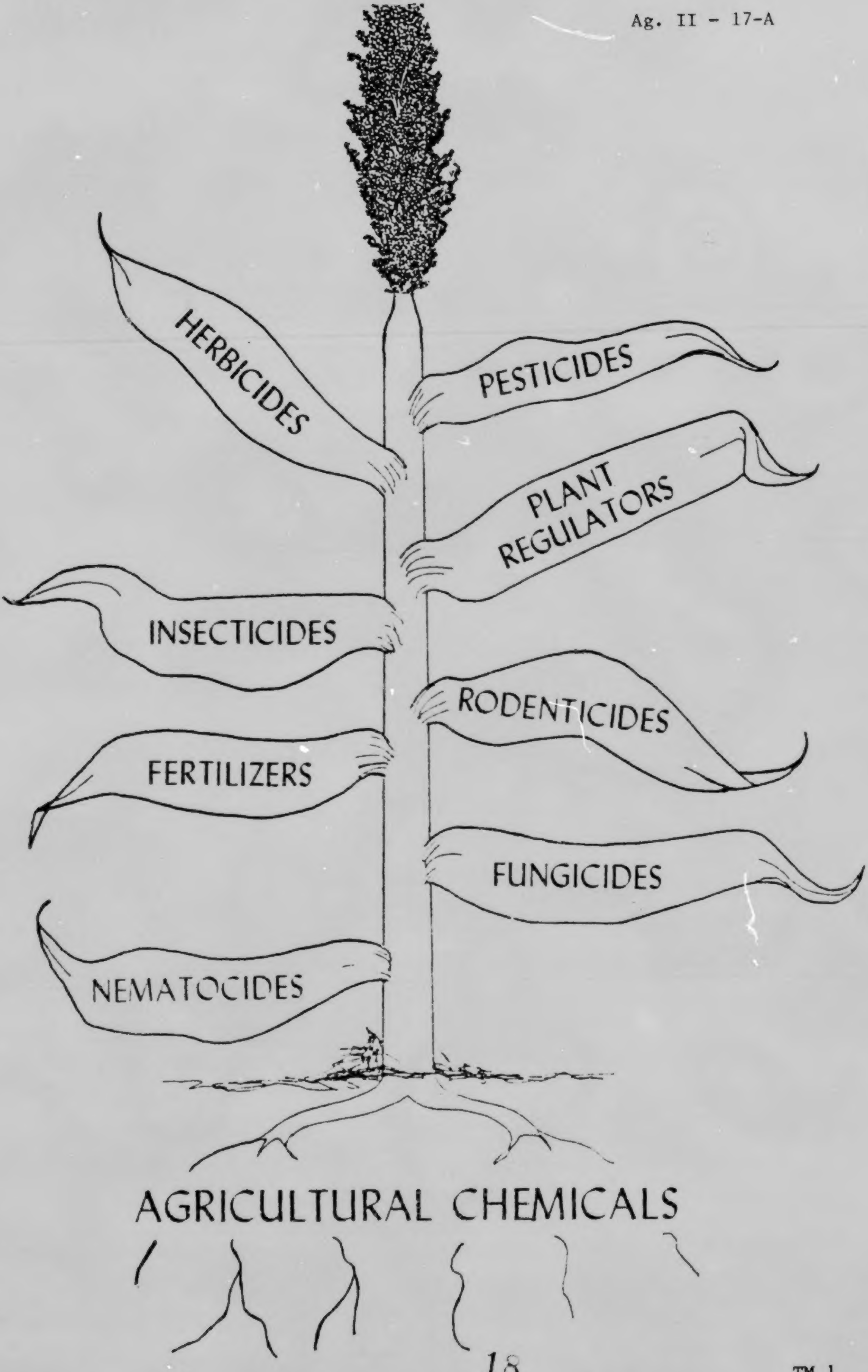
I affirm that the grower (farmer) has been notified of the 30 day pre-harvest restriction and the 60 day crop rotation restriction of the chemical label. I agree to notify the Kansas State Board of Agriculture of any accident involving the handling or application of this chemical.

____________________ Signature of Applicator

____________________ Date

This form must be distributed within seven days of the above date to:

White - Entomology Div., KS State Board of Agriculture, 1720 S. Topeka Ave., Topeka, KS 66612
Canary - Property Owner/Farm Operator
Pink - Applicator's File


HERBICIDES
PESTICIDES
PLANT REGULATORS
INSECTICIDES
RODENTICIDES
FERTILIZERS
FUNGICIDES
NEMATOCIDES

AGRICULTURAL CHEMICALS

ORAL LD_{50} VALUES

DEGREE OF TOXICITY	ACUTE ORAL LD_{50} FOR ANY ANIMAL (MG/KG.)	PROBABLE LETHAL ORAL DOSE OF TECHNICAL (UNDILUTED) MATERIAL FOR HUMAN ADULT
EXTREMELY TOXIC	LESS THAN 5	A FEW DROPS
EXTREMELY TOXIC	5 TO 50	"A PINCH" TO 1 TEASPOON
VERY TOXIC	50 TO 500	1 TEASPOONFUL TO 2 TABLESPOONFULS
MODERATELY TOXIC	500 TO 5,000	1 OUNCE TO 1 PINT (1 POUND)
SLIGHTLY TOXIC	5,000 TO 15,000	1 PINT TO 1 QUART (2POUNDS)

CLINICAL HANDBOOK FOR ECONOMIC POISONS, U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE.

SAMPLE CHEMICAL LABEL

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

FOR RETAIL SALE AND USE ONLY IN STATES WITH A RESTRICTED USE PERMIT PROGRAM APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

VELSICOL®

HEPTACHLOR 20G

GRANULAR INSECTICIDE

KEEP OUT OF THE REACH OF CHILDREN

WARNING

See below for additional precautions

E.P.A. Reg. No. 876-265-AA
E.P.A. Est. No. 1029—IA—1

NET CONTENTS: 50 POUNDS 15-30 MESH

SPECIMEN LABEL

ONLY FOR CONTROL OF CUTWORMS ON FIELD CORN

ACTIVE INGREDIENTS:	
Heptachlor*	20.00%
Related Compounds	7.00%
INERT INGREDIENTS	73.00%
TOTAL	100.00%

*Heptachlorotetrahydro-4, 7-methanoindene

STATEMENT OF PRACTICAL TREATMENT

INTERNAL—Emetic of 1 tablespoonful mustard in tumbler of water. Call a physician.
EXTERNAL—In case of spillage on skin, wash promptly with soap and water.

VELSICOL CHEMICAL CORPORATION
341 East Ohio Street, Chicago, Illinois 60611

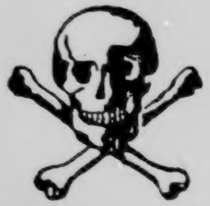
Ag. II - 21-A

TM 3

KEY WORDS ON LABELS

Warning:
Keep out of reach of children.
See additional warning statements left of container seam.

CAUTION
KEEP OUT OF REACH OF CHILDREN
See Side Panel for Additional Cautions



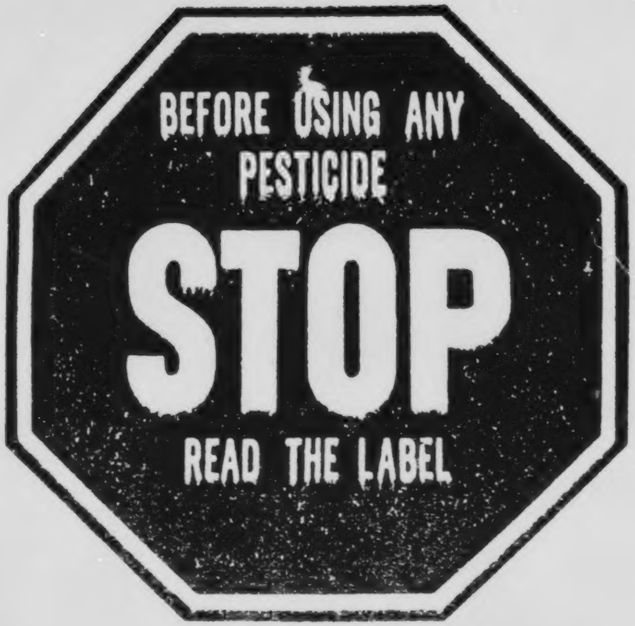
CAN KILL YOU

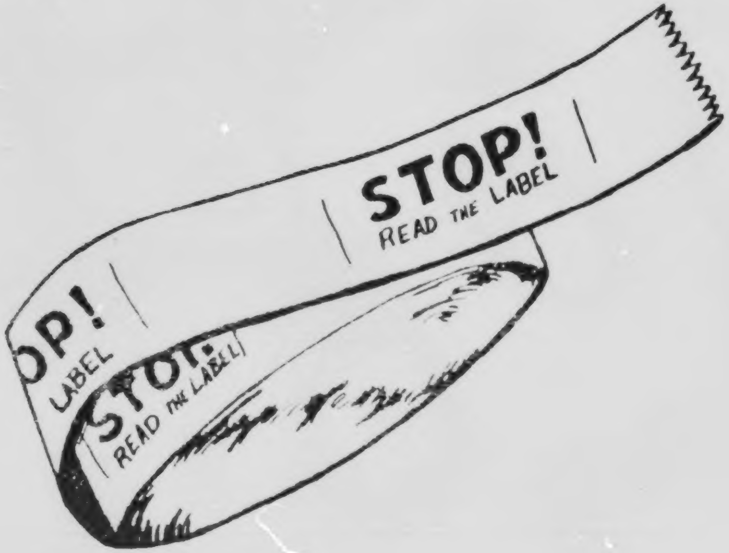
POISON
See side panels
for antidote
and precautions

DANGER
Keep out of reach
of children

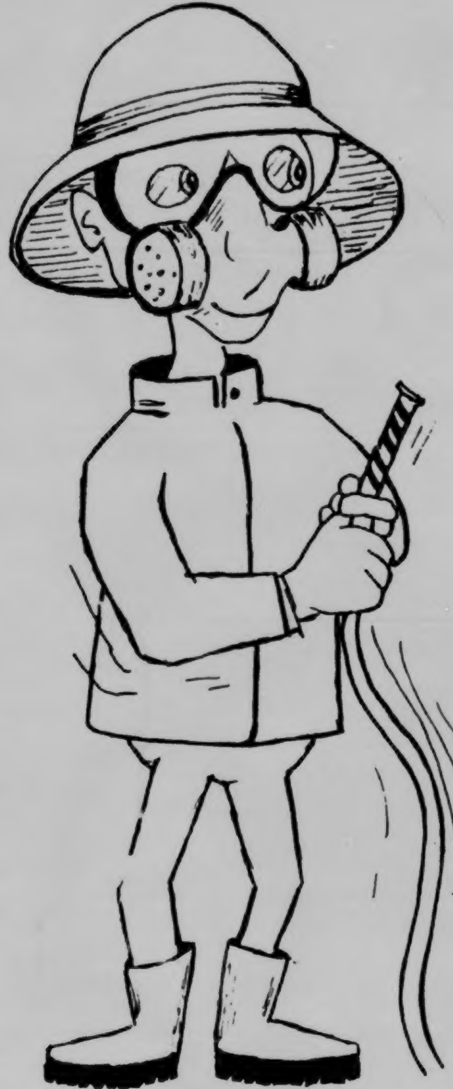
Ag. II - 23-A

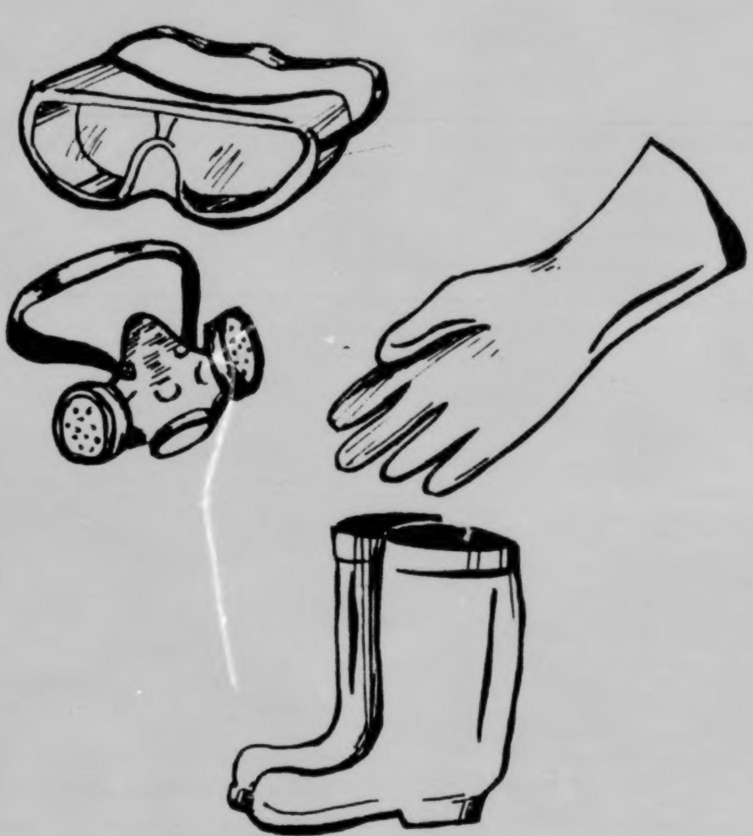
SAFETY PRECAUTION BEFORE CHEMICAL USE


BEFORE USING ANY PESTICIDE
STOP
READ THE LABEL


STOP!
READ THE LABEL
OP!
LABEL
STOP!
READ THE LABEL

Proper Spray Clothing

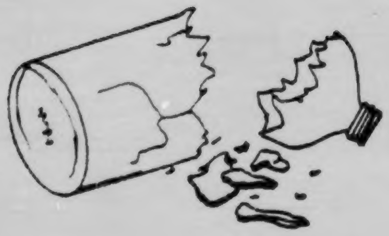




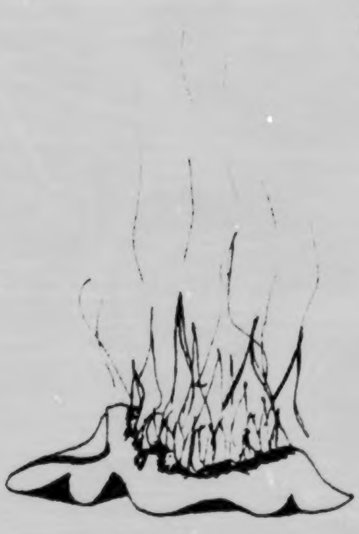
DISPOSAL OF EMPTY CONTAINERS

Ag. II - 29-A

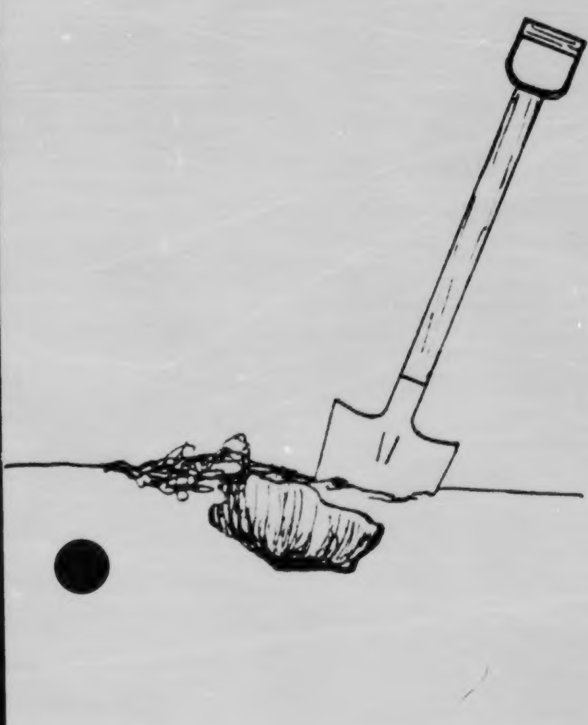
BREAK & BURY



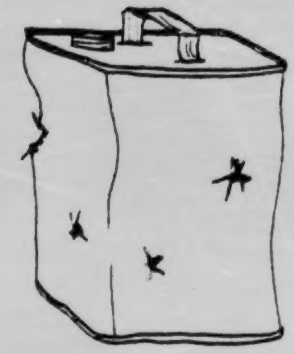
BURN



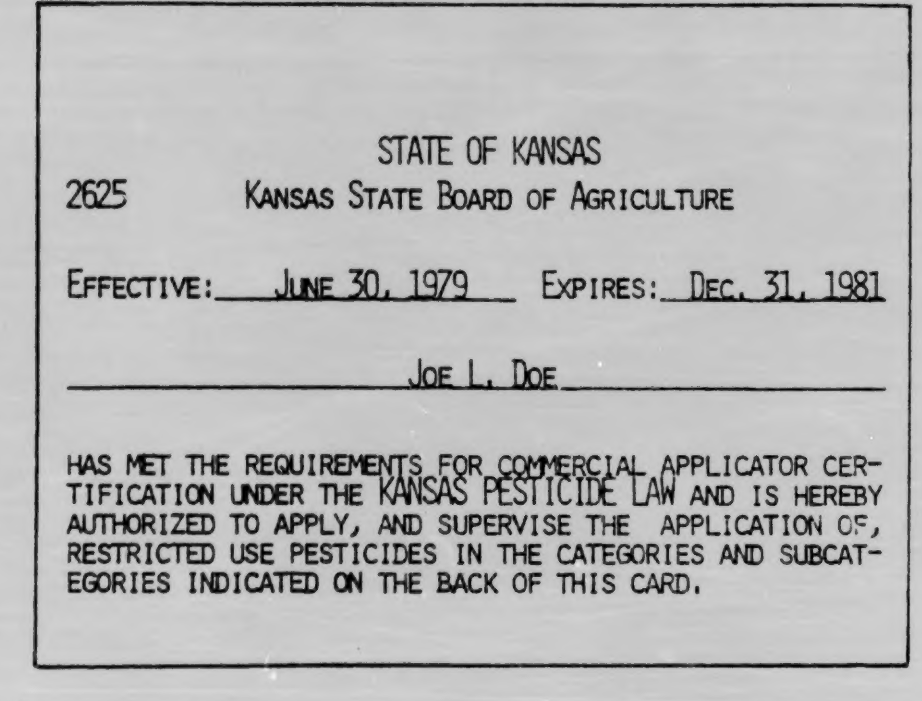
BURY



PUNCTURE & BURY



CERTIFICATION CARD FOR COMMERCIAL APPLICATOR



STATE OF KANSAS

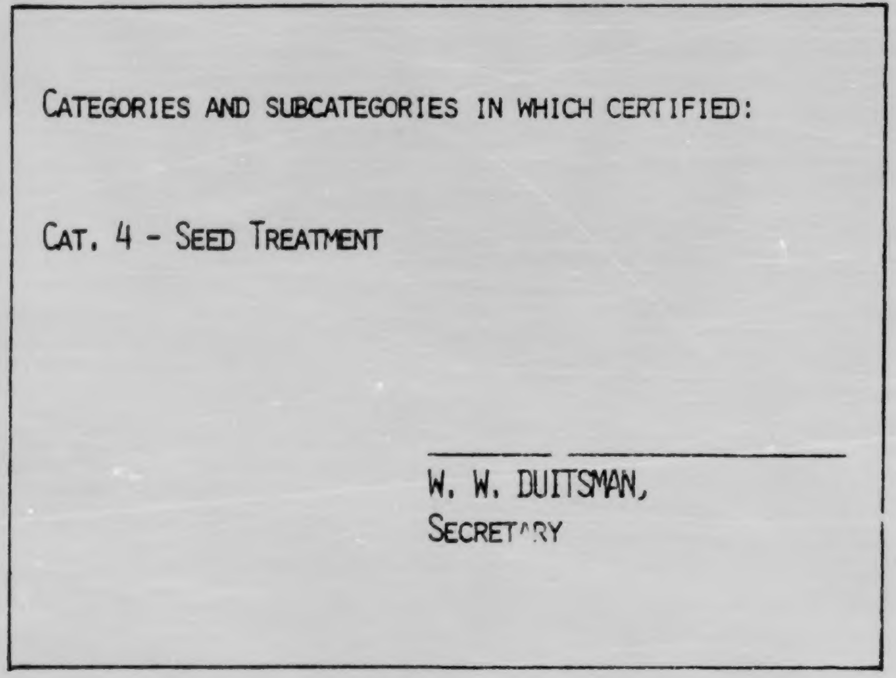
2625 KANSAS STATE BOARD OF AGRICULTURE

EFFECTIVE: JUNE 30, 1979 EXPIRES: DEC. 31, 1981

JOE L. DOE

HAS MET THE REQUIREMENTS FOR COMMERCIAL APPLICATOR CERTIFICATION UNDER THE KANSAS PESTICIDE LAW AND IS HEREBY AUTHORIZED TO APPLY, AND SUPERVISE THE APPLICATION OF, RESTRICTED USE PESTICIDES IN THE CATEGORIES AND SUBCATEGORIES INDICATED ON THE BACK OF THIS CARD.

- FRONT



CATEGORIES AND SUBCATEGORIES IN WHICH CERTIFIED:

CAT. 4 - SEED TREATMENT

W. W. DUITSMAN,
SECRETARY

- BACK

CATEGORIES OF COMMERCIAL APPLICATORS

CATEGORY NUMBER	CATEGORY
1A	AGRICULTURE - PLANT PEST CONTROL
1B	AGRICULTURE - ANIMAL PEST CONTROL
1C	AGRICULTURE VERTEBRATE PEST CONTROL
2	FOREST PEST CONTROL
3A	ORNAMENTAL PEST CONTROL
3B	TURF PEST CONTROL
4	SEED TREATMENT
5	AQUATIC PEST CONTROL
6	RIGHT-OF-WAY PEST CONTROL
7A	WOOD DESTROYING PEST CONTROL
7B	STORED PRODUCTS PEST CONTROL
7C	INDUSTRIAL WEED CONTROL
7D	HEALTH RELATED PEST CONTROL
7E	STRUCTURAL PEST CONTROL
8	PUBLIC HEALTH PEST CONTROL
10	DEMONSTRATION & RESEARCH PEST CONTROL

AGRICULTURAL CHEMICAL
UNIT I

ASSIGNMENT SHEET #1--EMERGENCY FIRST AID

Review the information on acute pesticide poisoning and list the symptoms and first aid practices.

PESTICIDE	SYMPTOMS		FIRST AID
Organic Phosphates	1.	10.	1.
Parathion	2.	11.	2.
TEPP	3.	12.	3.
Di-syston	4.	13.	4.
Thimet	5.	14.	5.
Malathion	6.	15.	6.
Diazinon	7.	16.	7.
	8.	17.	8.
	9.	18.	9.
Chlorinated Hydracarbons	1.		1.
Aldrin	2.		2.
Diedrin	3.		3.
Cholrodane	4.		4.
Lindane	5.		
	6.		
	7.		
	8.		
	9.		
	10.		
Carbonates			
Sevin			

AGRICULTURAL CHEMICALS
UNIT I

TEST

1. Define the following terms:
   a. Pesticide -
   b. Defoliant -
   c. Antibiotics -
   d. Poison -
   e. Toxicity -
   f. LD_{50} -
   g. Acute exposure -
   h. Hazard -
   i. Safety -
   j. Insecticide -

2. List three sources of information regarding the safe handling of agricultural chemicals.
   a.
   b.
   c.

3. Name five items that all chemical labels must state.
   a.
   b.
   c.
   d.
   e.

4. What are the responsibilities of Kansas State University in regard to agricultural chemicals?

5. What are three benefits of agricultural chemicals?
   a.
   b.
   c.

6. Name three disadvantages of using chemicals.
   a.
   b.
   c.

7. Name five major areas of pests that cause damage to crops and livestock.
   a.
   b.
   c.
   d.
   e.

8. Name six economic losses which may occur due to pests.
   a.
   b.
   c.
   d.
   e.
   f.

9. What is the difference between a repellent, a stomach poison, and a contact insecticide poison?

10. Name three ways chemicals enter the body.

    a.

    b.

    c.

11. What types of protective clothing and accessories should be worn when using agricultural chemicals.

    a.

    b.

    c.

    d.

    e.

12. Name three important rules to follow before attempting to use chemicals.

    a.

    b.

    c.

13. Name three safety precautions when applying chemicals.

    a.

    b.

    c.

14. Name three safety precautions after using chemicals.

    a.

    b.

    c.

15. How should empty containers be disposed of?

    a.

    b.

16. Name three safety precautions used in storing chemicals.

    a.

    b.

    c.

17. List and discuss four regulatory procedures involved to apply and/or supply agricultural chemicals.

    a.

    b.

    c.

    d.

FUTURE FARMERS OF AMERICA
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to accept the role as a leader within his or her FFA chapter. The student should be able to adopt the FFA Code of Ethics and demonstrate the proper wear of the FFA jacket. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Select eight leadership activities that would apply to the FFA chapter and community.
2. Select the nine items in the Code of Ethics.
3. Name three functions of the Future Farmer Supply Service as related to the local chapter.
4. Identify the symbols of the FFA officers' stations.
5. Rank the order of business in sequence for an FFA meeting.
6. Name five activities that a local chapter can sponsor during National FFA Week.
7. Identify the locale of the FFA officers' stations during an FFA meeting when given a diagram of the meeting room.
8. Demonstrate the attitude to perform the following:
    a. Apply the Code of Ethics to the FFA chapter.
    b. Apply leadership activites to the FFA chapter and community.
    c. Wear the FFA jacket according to regulations.
    d. Apply the eleven items that constitute a good FFA meeting to his/her chapter meetings.
    e. Apply the fourteen points on Successful Chapter Operation to his/her local chapter.

FUTURE FARMERS OF AMERICA
UNIT I

INFORMATION SHEET

I. Leadership activities

   A. Provide special training for newly elected officers

   B. Elect auxiliary officers

   C. Conduct chapter public speaking contest

   D. Provide experience in parliamentary procedure

   E. Provide experience in conducting meetings

   F. Participate in a chapter leadership training school

   G. Send members to state and district conventions

   H. Encourage sending President to National Leadership conference

   I. Provide committee work

   (NOTE: Each member should be assigned to a standing committee.)

   J. Assist members to apply for the higher degrees

   K. Encourage participation in school activities that involve leadership

   L. Encourage participation in community activities

II. Code of Ethics

   A. Dress neatly and appropriately for the occasion

   B. Show respect for the rights of others and be courteous at all times

   C. Be honest and do not take unfair advantage of others

   D. Respect property of others

   E. Refrain from loud, boisterous talk, swearing, and other unbecoming conduct

   F. Demonstrate sportsmanship in the show ring, judging cotests, and meetings. Be modest in winning and generous in defeat

   G. Attend mettings promptly and respect the opinions of others in discussion

   H. Take pride in your organization, in our activities, supervised experience programs, exhibits, and in our occupation of agriculture

   I. Share with others experiences and knowledge gained by attending national and state meetings

III. Proper wear of FFA jacket

   A. The jacket or blazer should only be worn by members.

   B. It should be kept clean and neat at all times.

   C. The jacket should have only a large emblem on the back and a small emblem on the front; the name of the State Association and the name of the local chapter on the back; and the name of the individual and one office or honor on the front.

   D. The jacket should be worn by officers and members on all official FFA occasions, as well as other occasions where the chapter or State Association is represented. It may be worn to school and other appropriate places.

   E. The jacket should only be worn to places that are appropriate for members to visit.

   F. School letters and insignia of other organizations should not be attached to or worn on the jacket.

   G. When the jacket becomes too faded and worn to wear in public, it should be discarded or the emblems and lettering removed.

   H. The emblems and lettering should be removed if the jacket is given or sold to a non-member.

   I. A member always acts like a lady or gentleman when wearing the jacket.

   J. Members should refrain from use of tobacco and alcohol while wearing the FFA jacket or officially representing the organization.

   K. All chapter degree, officer, and award medals should be worn beneath the name on the right side of the jacket, with the exception that a single State Farmer charm and American Farmer key should be worn above the name or attached to a standard key chain. No more than three medals should be worn on the jacket; these should represent the highest degree earned, the highest office held, and the highest award earned by the member.

IV. Functions of Future Farmer Supply Service

   A. Supplies all official FFA merchandise

   B. Insures uniformity in official FFA merchandise

   C. Provides high-quality official merchandise

V. Symbols of FFA officers' stations (Transparency 1)

   A. Rising sun - President

   B. Plow - Vice-President

   C. Ear of corn - Secretary

   D. Bust of Washington - Treasurer

E. American flag - Reporter

F. Shield of friendship - Sentinel

G. Owl - Advisor

VI. Items that constitute a good FFA meeting

A. Effective use of an executive committee to assure careful planning in advance of the meeting time

B. Starts and closes on time

C. Proceeds according to an established order of business

D. Conducted according to accepted parliamentary procedure

E. Includes well-prepared committee's, secretary's and treasurer's reports

F. Shows that each officer is familiar with his or her duties and responsibilities

G. Commands the interest and attention of all members

H. Provides for maximum member participation and develops the cooperative attitude

I. Includes business, entertainment features, and refreshments

J. Moves along with "snap" thus preventing monotony and the wasting of time

K. Proceeds with a minimum of active participation by the Advisor

VII. Order of business for an FFA meeting

A. Opening ceremony

B. Minutes of the previous meeting

C. Orders of the day

D. Officers' reports

E. Reports on chapter program of activities

F. Special features

G. Unfinished business

H. Committees' reports

1. Standing

2. Special

I. New business

J. Degree and installation ceremonies

(NOTE: Used only when new members are initiated, Greenhand raised to the Chapter Farmer degree, or when officers are installed.)

K. Closing ceremony

L. Entertainment, recreation, refreshments

VIII. National FFA Week activities

A. Radio and TV programs

B. FFA Week articles in newspapers

C. School assembly

D. Civic club program

E. Parent and son/daughter banquet

F. Posters displayed around town

G. Attend church as a group

H. Window displays

IX. Points on successful chapter operation

A. Are the officers selected through a nominating committee on the basis of special qualifications? Do they meet frequently to plan work and receive assistance?

B. Are school authorities and others concerned, consulted, and kept informed on the activities of the chapter?

C. Does the chapter have a written program of activities formulated by the members? How much of last year's program was completed?

D. Is there a committee functioning on each division of the present program of activities?

E. Does the chapter have a written budget based primarily on the program of activities and a sound plan developed for securing the necessary funds with which to operate

F. Is the expenditure of chapter funds properly safeguarded?

G. Do a high percentage of members get experience in the work of the chapter and do they have definite responsibilities that contribute to its success or failure?

H. Does the chapter possess the standard meeting equipment and is it properly mounted and protected?

I. Has a satisfactory system of chapter records and reports been developed?

J. Is at least one planned meeting held each month when sufficient time is available to take care of all chapter business. Is the program for each chapter meeting posted in advance? Is accepted parliamentary procedure followed?

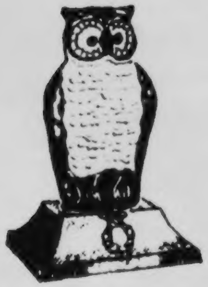
K. Does the chapter name an executive committee with power to act for the chapter when necessary?

L. Do all of the students enrolled in vocational agriculture belong to the chapter? Are qualified members advanced systematically to higher degrees of membership?

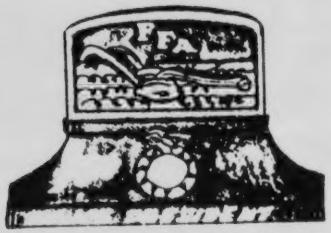
M. What percentage of the membership attend meetings regularly?

N. Do a high percentage of members know what they should know about FFA? Is systematic, continuous leadership training given to all members starting with them as Greenhands?

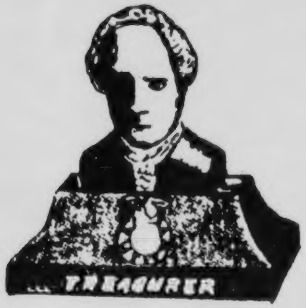
Symbols of Officer's Stations



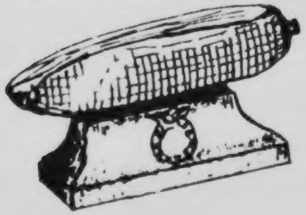
Advisor



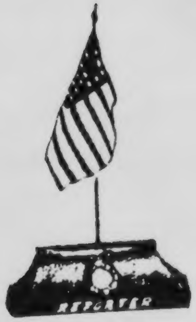
Vice-President



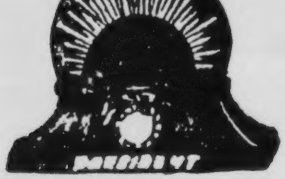
Treasurer



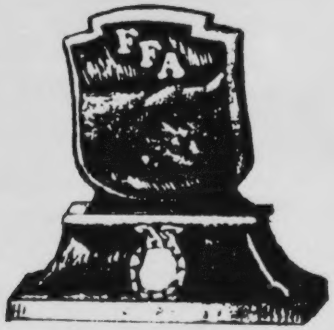
Secretary



Reporter



President



Sentinel

FUTURE FARMERS OF AMERICA
UNIT I

TEST

1. Identify the following items as to leadership activities or Code of Ethics by placing an "L" for leadership activities and an "E" for Code of Ethics.

    _____a. Provide special training for newly elected officers.

    _____b. Respect property of others.

    _____c. Dress neatly and appropriately for the occasion.

    _____d. Encourage participation in community activities.

    _____e. Conduct chapter public speaking contest.

    _____f. Take pride in your organization, in our activities, supervised programs, exhibits, and in our occupation of agriculture.

    _____g. Refrain from loud, boisterous talk, swearing, and other unbecoming conduct.

    _____h. Send members to state and district conventions.

    _____i. Provide committee work.

    _____j. Show respect for the rights of others and be courteous at all times

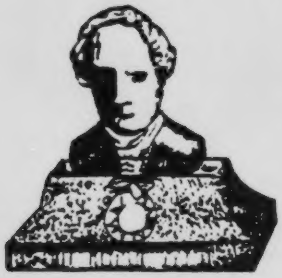
2. What are three functions that the Future Farmer Supply Service provides to the FFA chapters?

    a.

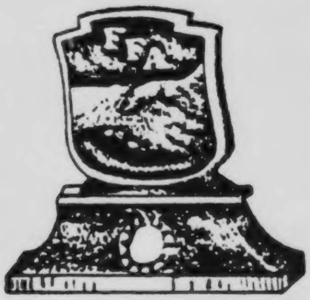
    b.

    c.

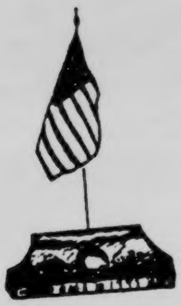
3. Identify the FFA officers' symbols from the following diagrams.

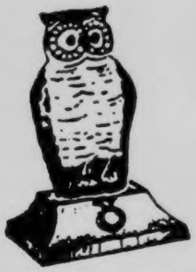


a. ____________________________

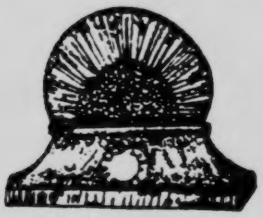


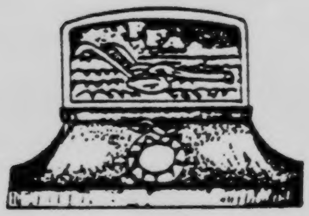
b. ____________________________



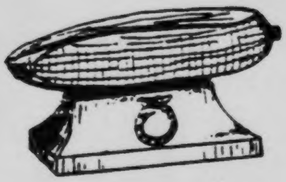


c. ______________________ d. ______________________





e. ______________________ f. ______________________



g. ______________________

4. Place in sequential order the order of business for a FFA meeting, 1 through 12.

_____a. Opening ceremony

_____b. Special features

_____c. Unfinished business

_____d. Minutes of the previous meeting

_____e. Committees' reports

_____f. New business

_____g. Degree and installation ceremonies

_____h. Order of the day

_____i. Officer's reports

_____j. Reports on Chapter Program of Activities

_____k. Closing ceremony

_____l. Entertainment, recreation, refreshments

5. Name five activities that a local chapter can sponsor during National FFA Week.

   a.

   b.

   c.

   d.

   e.

6. Write the names of the officers' stations illustrated below.

   a. ____________________

   b. ____________________

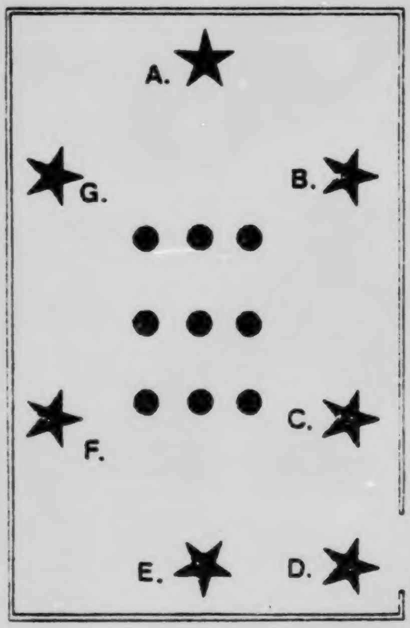
   c. ____________________

   d. ____________________

   e. ____________________

   f. ____________________

   g. ____________________



7. Evaluation on the the following items will be made by the instructor.

   a. Use of the Code of Ethics

   b. Application of leadership activities to the FFA Chapter and community.

   c. Proper wear of the FFA jacket

   d. Practice of the eleven items that constitute a good FFA meeting

   e. Use of the fourteen points on successful chapter operation

BECOMING A GOOD LEADER
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to name characteristics of a good leader. The student should be able to develop himself or herself into a good leader and demonstrate his or her ability to lead others. The student should take a Personality Self-Rating Scale to determine how he/she rates as a leader. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define leadership.
2. Select five characteristics of a good leader.
3. Discuss in a short paragraph why he wants to become a leader.
4. Name four steps he must take in order to become a good leader.
5. Name five values of having a leadership ability.
6. Identify himself or herself as a leader by taking the Personality Self-Rating Scale.
7. Identify some leaders within his/her community and list three factors that identify each as a leader.

BECOMING A GOOD LEADER
UNIT II

INFORMATION SHEET

I. Leadership - The combination of qualities which inspires confidence, draws others toward the leader, and causes them to follow.

II. Characteristics of a good leader

A. Preparedness - Know leadership takes work as well as practice

B. Group mindedness - Regard yourself as a part of the group. Say "we" instead of "I"; don't try to run the crowd. Instead, be guided by the crowd's wishes

C. Consideration for others - Be understanding and friendly

D. Poise - Don't let irritations bother you

E. Humility - Be confident, but not cocky; don't be afraid to reveal you don't know everything

F. Hard work - Don't ask anyone to do something that you would not be willing to do yourself

G. Responsibility - Live up to your word and duties

H. Cooperativeness - Know how to work with others and enjoy working with them

I. Happiness - Enjoy life: The simple things as well as the big

J. Imagination - Help the persons in your group to learn and grow through the activities

K. Preciseness - Be able to express yourself effectively

L. Pride - Take pride in what you do; take pride in being a leader, but earn it

M. Neatness - Always be neat in dress and personal apprearance

N. Courtesy - The words "please" and "thank you" pay dividends; use them often

O. Understanding - Know members' opinions and be ready to meet changing situations

P. Ambition - Set goals and make them high, but be sure to reach them

Q. Openmindedness - Take advice, but do your own thinking

R. Curiosity - Analyze all the facts before you draw conclusions

S. Energy - Do your best at all times; plan to make the most effective use of your time

III. Reasons to become a good leader
   A. Leadership needed in all fields
   B. Challenge to learn
   C. Creates respect for others
   D. Aids in maturity

IV. Steps in becoming a good leader
   A. Leaders are made, not born
   B. Study qualities of a good leader
   C. Evaluate weak and strong points of yourself
   D. Become a good follower
   E. Develop a plan for training yourself as a leader

V. Values of having leadership ability
   A. Education
   B. Respect
   C. Advancement in an occupation
   D. Financial betterment
   E. Pride
   F. Security

BECOMING A GOOD LEADER
UNIT II

ASSIGNMENT SHEET #1 - PERSONALITY SELF-RATING SCALE

Circle the appropriate number following each trait. Four is outstanding, three is above average, two is average, one is poor. Total your score below.

1. Do I maintain a well groomed appearance? 1 2 3 4
2. Do I have a pleasing voice? 1 2 3 4
3. Is my posture alert and poised? 1 2 3 4
4. Is my disposition cheerful? 1 2 3 4
5. Do I make friends easily? 1 2 3 4
6. Do I exert a positive leadership? 1 2 3 4
7. Am I generally thoughtful of the feelings of others? 1 2 3 4
8. Is my enthusiasm sincere and contagious? 1 2 3 4
9. Do I persevere until I achieve success? 1 2 3 4
10. Am I sincere in my interest in other people? 1 2 3 4
11. Am I ambitious to get ahead? 1 2 3 4
12. Do I get along well with others? 1 2 3 4
13. Do I react constructively to criticism? 1 2 3 4
14. Do I remember names and faces? 1 2 3 4
15. Am I punctual on all occasions? 1 2 3 4
16. Do I have and evidence a spirit of cooperation? 1 2 3 4
17. Am I free from prejudice? 1 2 3 4
18. Do I know how people react in most situations? 1 2 3 4
19. Am I generally a good listener? 1 2 3 4
20. Do I refuse to allow what others say to hurt me? 1 2 3 4
21. Can I criticize without giving offense? 1 2 3 4
22. Do I usually like people for what they are, or do I wait to see if they like me? 1 2 3 4
23. Do I enjoy being part of a group? 1 2 3 4
24. Am I reliable? 1 2 3 4
25. Can I adapt myself to all situations? 1 2 3 4
26. Am I easily discouraged? 1 2 3 4
27. Do I apply myself to the problems of each day? 1 2 3 4

28. Can I make a decision quickly and accurately? 1 2 3 4

29. Am I loyal to my superiors and associates? 1 2 3 4

30. Do I try to get the other fellow's point of view? 1 2 3 4

31. Am I neat and clean in my work as well as my personal appearance? 1 2 3 4

32. Do I know where I make my mistakes, and do I admit them? 1 2 3 4

33. Am I looking for opportunities to serve others better? 1 2 3 4

34. Am I following a systematic plan for improvement and advancement? 1 2 3 4

35. Can I accept honors and advancements and yet keep my feet on the ground? 1 2 3 4

36. Am I playing the game of life honestly and fairly with myself, my fellow members, and others with whom I work? 1 2 3 4

BECOMING A GOOD LEADER
UNIT II

ASSIGNMENT SHEET #2 - IDENTIFYING LEADERS WITHIN YOUR COMMUNITY

Identify three individuals in your local community which appear to you as good leaders. After you have identified the leaders, list three factors that identify them as such.

NAME	LEADERSHIP QUALITIES
1. ______________________	a. ______________________
	b. ______________________
	c. ______________________
2. ______________________	a. ______________________
	b. ______________________
	c. ______________________
3. ______________________	a. ______________________
	b. ______________________
	c. ______________________

bECOMING A GOOD LEADER
UNIT II

EVALUATION OF ASSIGNMENT SHEET #1

To Evaluate your scores follow the following scale: If your score totaled over 100, your personality rating is definitely superior. If you have been honest with yourself, you are among the people who are most likely to succeed. Scores of 90-100 is above average. Scores of 75-90 is average. If your score is below 75 this shows plenty of room for improvement.

BECOMING A GOOD LEADER
UNIT II

TEST

1. Define leadership:

2. Select five characteristics of a good leader. Place an "X" by the correct characteristics.

_____a. Be well prepared
_____b. Be responsible
_____c. Have low goals
_____d. Take advice
_____e. Have no pride
_____f. Be neat
_____g. Get the facts

3. Why do you want to become a good leader?

4. What are four steps to follow in becoming a good leader?

a.
b.
c.
d.

5. Name five values of having leadership ability.

a.
b.
c.
d.
e.

ANALYSIS AND EVALUATION OF THE ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to name reasons for using job analysis and evaluation. He or she should be able to determine the benefits of the program. He or she should be able to identify the strong and weak points of the experience program and compare them to his classmates. This knowledge will be evidenced through filling out the completion reports.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Name three reasons for using job analysis.
2. Describe the benefits and hazards of the experience program.
3. Identify the strong and weak points of the job experience program and compare them with other job experience programs of the class.
4. Complete an on-job evaluation sheet of the program.
5. Complete a Training Agreement.
6. Complete an accurate and current record book.

ANALYSIS AND EVALUATION OF THE ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

INFORMATION SHEET

I. Reasons for using job analysis

   A. Aids in the planning for the future opportunities and rewards of a job

   B. Serves as a comparison between one or more job opportunities

   C. Identifies interests, strengths and weaknesses of the individual

   D. Provides an evaluation and appraisal of an agribusiness job

II. Analysis of the benefits and hazards of the experience program

   A. Physical requirements

   B. Educational requirements

   C. Environmental conditions to work with

   D. Starting and projected salary and other monitary benefits

   E. Future advancement and opportunities

   F. Living conditions the job would offer the family

   G. Was the job what I expected and was I happy?

      1. Why

      2. Suggestions for improvement

III. Comparison of strong and weak points of job experience program

   A. Use the chart on job evaluation sheet for comparison

   B. Obtain information from each student

IV. On-Job Experience Evaluation Sheet

A. Example

Job Title	Physical Requirements	Educational Requirements	Environment Condition Expected	Starting & Projected Salary	Future Advancement & Opportunities	Family Living Conditions	Was the job what I expected?
Parts Salesman	Active & Mechanical	Voc. Educ. & job training	Inside & Outside	$2.90/hr. to $13,000/yr.	Limited in areas	Depends on city	Yes
Nursery Worker	Some heavy outside work	On-job training or College degree	Outside	$2.90/hr. to $12,000/yr.	Depends on Education & locality	Good	Hard Work
Farm Worker	Labor	Farm experience Agriculture Education	Outside	$3/hr. and up	Very Good	Farm	Yes

V. Directions for completing Cooperative Training Agreement

A. Part I of form

1. Check "Secondary" or "Post Secondary" program as appropriate in the top left hand corner of the form

2. Check the appropriate program area in the top center or right hand corner of the form

B. Fill in the information as indicated

1. Training Station: Place of employment of student

2. Student: Student's full name

3. Program: Program name as reported on the VE-20 form

4. School: Educational institution name

5. LEA No.: Enter number of local education agency

6. Occupation: Job title student holds at time agreement is made. May be different than occupational objective

7. U.S.O.E. Code: Office of Education six-digit code assigned to specific occupations as specified by the Vocational Education Handbook

8. Taxed Wage: Approximate taxed wage of student when training began

9. The classroom instruction dates should indicate beginning and ending dates for student. These are the same dates as reported on the VE-50

C. Training Plan (outline of job tasks): Attach individual student's job outline (training plan) as designed for this training station. Examples are available from State Department of Education Cooperative Education Specialist.

D. Have the employer, coordinator, and the student sign the form. Secondary students must also obtain a parent/guardian signature. The signature date is the date signed by the parties.

E. This form needs to be maintained for three(3) years only by those employers who intend to use the Targeted Jobs Tax Credit (TJTC).

F. The green copy of this form (Training Agreement) is due in the State Department of Education by November 15 of each year. Any revision on any training agreement of any new additional training agreement forms should be filed with the State Department within 30 days after said change or addition.

(NOTE: Although the school is required to keep a copy of the Training Plan (outline of job tasks), you are not required to send a copy to the State Department of Education.)

ASSIGNMENT SHEET #1 - COMPLETING ON-JOB-EXPERIENCE EVALUATION SHEET

Job Title	Physical Requirements	Educational Requirements	Environment Condition Expected	Starting & Projected Salary	Future Advancement & Opportunities	Family Living Conditions	Was the job what I expected?

ANALYSIS AND EVALUATION OF THE ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

ASSIGNMENT SHEET #2
KANSAS VOCATIONAL EDUCATION TRAINING AGREEMENT

Complete the following form:

KSDE Form #0-03-03-106
Date 2/80

I. a. Program is:
(Please check one)
____ Secondary
____ Post Secondary

b. Please check one:

____ Agriculture
____ Distributive Education
____ Health
____ Business/Office Education
____ Home Economics
____ Industrial Education
____ Special Voc-Ed Program
____ Includes more than one service area

KANSAS VOCATIONAL EDUCATION TRAINING AGREEMENT

II. The ______________________ will permit __________________,
(a) Training Station (b) Student

a student in the __________________________ Program at
(c) Program

______________________________, LEA No.______ to enter this
(d) School

establishment for the purpose of gaining training of experience

as (a) (an) ____________________ ______________________
(f) Occupation (g) U.S.O.E. Code

at __________________. The supervised on-the-job training
(h) Taxed Wage

period will begin the _____ day of _____________, 19________;
(i)

classroom instruction will begin the ______ day of ___________, 19 _____, and extend through the ______ day of ________________, 19 _____. The program is designed to operate during the nine-month school year. Students should work an average of 15 hours each week throughout the school year, accumulating a minimum of

450 hours. The students should receive training or experience in a variety of areas which gradually progresses in difficulty. The training will be in accordance with an attached outline of Job Tasks, made and agreed upon by the employer, instructor-coordinator, and student.

General Provisions of Training

1. Supervised occupational experience, which includes related classroom instruction, is an integral part of an approved vocational education program. FOR SECONDARY PROGRAMS, PARTICIPATION IN VOCATIONAL STUDENT ORGANIZATIONS IS ALSO INCLUDED.

2. Status of the student shall be that of student-trainee, who does not displace a full-time worker.

3. The employer will rate the student's supervised occupational experience performance _______ times a year.

4. The instructor-coordinator will assist with adjustment of problems encountered on the job. The student should communicate all classroom and on-the-job concerns to the instructor-coordinator. FOR SECONDARY PROGRAMS, THE PARENT MAY ALSO COMMUNICATE SUCH CONCERNS TO THE INSTRUCTOR-COORDINATOR.

5. For post secondary this agreement may be terminated for just cause by any or all parties concerned; the instructor-coordinator must be notified. FOR SECONDARY, THIS AGREEMENT MAY BE TERMINATED BY THE INSTRUCTOR-COORDINATOR OR THE EMPLOYER.

6. Safety instructions shall be given in the classroom and at the work station.

7. All parties should encourage both classroom and on-the-job attendance.

FOR SECONDARY ONLY

8. Duties declared hazardous shall be incidental to training, intermittent, and under direct and close supervision. (Child Labor Bulletin No. 101: Nonagricultural Hazardous Occupations Orders Nos. 5, 8, 10, 12, 14, 16, and 17 contain exemptions for apprentices and student-learners.)

9. Upon student completion of or withdrawal from the program, the employer will no longer be eligible for student Targeted Jobs Tax Credit (TJTC). Please see Internal Revenue Service Publication 906, "Targeted-Jobs Tax Credit and Win Credit," for information.

III. Attach training plan

IV. ______________________________ ______________________________ /
Firm Student Date

BY ______________________________ / ______________________________ /
Employer/Supervisor Date Parent/Guardian Date
(FOR SECONDARY ONLY)

______________________________ /
Instructor-Coordinator Date

V. Employers and Instructor-Coordinators must retain a copy of this form for (3) years, providing verification for tax credit and audits.

VI. White copy to training Station--Yellow to Trainee--Green to State Department of Education--Pink to coordinator or school file.

An Equal Employment/Educational Opportunity Agency

VEK/8

ANSWERS TO ASSIGNMENT SHEET #2

(This is a sample filling out of the form. The student's forms should be filled out similarily and to the instructor's satisfaction.)

KSDE Form #0-03-03-106
Date 2/80

I. a. Program is:
(Please check one)
X Secondary
___ Post Secondary

b. Please check one:
X Agriculture
___ Distributive Education
___ Health
___ Business/Office Education
___ Home Economics
___ Industrial Education
___ Special Voc-Ed Program
___ Included more than one service area

KANSAS VOCATIONAL EDUCATION TRAINING AGREEMENT

II. The Crossroads Elevator (a) Training Station will permit Jonathan Swift (b) Student, a student in the Production Agriculture (c) Program Program at Allenville High School (d) School, LEA No. 123 to enter this establishment for the purpose of gaining training of experience as (a) (an) Spray Foreman (f) Occupation 01.02 (g) U.S.O.E. Code at $3.75/hour (h) Taxed Wage. The supervised on-the-job training period will begin the 3 (i) day of September, 19 82; classroom instruction will begin the 28 day of August, 19 82, and extend through the 27 day of May, 19 83. The program is designed to operate during the nine-month school year. Students should work an average of 15 hours each week throughout the school year, accumulating a minumum of 450 hours. The students should receive training or experience in a variety of areas which gradually progresses in difficulty. The training will be in accordance with an attached outline of Job Tasks, made and agreed upon by the employer, instructor-coordinator, and student.

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General Provisions of Training

1. Supervised occupational experience, which includes related classroom instruction, is an integral part of an approved vocational education program. FOR SECONDARY PROGRAMS, PARTICIPATION IN VOCATIONAL STUDENT ORGANIZATIONS IS ALSO INCLUDED.

2. Status of the student shall be that of student-trainee, who does not displace a full-time worker.

3. The employer will rate the student's supervised occupational experience performance 6 times a year.

4. The instructor-coordinator will assist with adjustment of problems encountered on the job. The student should communicate all classroom and on-the-job concerns to the instructor-coordinator. FOR SECONDARY PROGRAMS, THE PARENT MAY ALSO COMMUNICATE SUCH CONCERNS TO THE INSTRUCTOR-COORDINATOR.

5. For post secondary, this agreement may be terminated for just cause by any or all parties concerned; the instructor-coordinator must be notified. FOR SECONDARY, THIS AGREEMENT MAY BE TERMINATED BY THE INSTRUCTOR-COORDINATOR OR THE EMPLOYER.

6. Safety instructions shall be given in the classroom and at the work station.

7. All parties should encourage both classroom and on-the-job attendance.

FOR SECONDARY ONLY

8. Duties declared hazardous shall be incidental to training, intermittent, and under direct and close supervision. (Child Labor Bulletin No. 101: Nonagricultural Hazardous Occupations Orders Nos. 5, 8, 10, 12, 14, 16, and 17 contain exemptions for apprentices and student-learners.)

9. Upon student completion of or withdrawal from the program, the employer will no longer be eligible for student Targeted Jobs Tax Credit (TJTC). Please see Internal Revenue Service Publication 906, "Targeted-Jobs Tax Credit and Win Credit," for information.

III. Attach training plan

IV. Thomas K Bost — Firm | Jonathan Swift — Student | 1 August 29, 1982 — Date

BY Thomas K Bost — Employer/Supervisor | 1 8-30-82 — Date | Mrs J K Swift — Parent/Guardian (FOR SECONDARY ONLY) | 1 Aug. 29, 1982 — Date

A U Teacher — Instructor-Coordinator | 1 8-29-82 — Date

V. Employers and Instructor-Coordinators must retain a copy of this form for (3) years, providing verification for tax credit and audits.

VI. White copy to training station—Yellow to Trainee--Green to State Department of Education—Pink to coordinator or school file.

An Equal Employment/Educational Opportunity Agency

VEK/8

ANALYSIS AND EVALUATION OF THE
ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

TEST

1. Name three reasons for using job analysis.

   a.

   b.

   c.

2. Give six of the benefits and hazards of the experience program.

   a.

   b.

   c.

   d.

   e.

   f.

3. Identify the strong and weak points of the job experience program and compare these findings with those of other students in your class.

4. If the On-Job Evaluation Sheet of the program is not completed ask your instructor when this should be completed.

5. If the Training Agreement is not completed at this time, ask your instructor when this should be completed.

6. Completion of an accurate and current record book should be done at this time. If it is not yet completed ask your instructor when this should be completed.

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to demonstrate his or her ability to make the proper entries in the Kansas Vocational Agriculture Record Book. This knowledge will be evidenced by completing the beginning of the year records in the record book and receiving an 85 percent on the record book grade sheet.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Complete all appropriate pages for the current year.
2. Review grading system for record book.

RECORD KEEPING -
OPENING THE VOCATIONAL - AGRICULTURE RECORD BOOK
UNIT II

INFORMATION SHEET

I. Appropriate pages should be completed through following steps to open your new record book

- A. Fill in name and year on cover page in ink. (Print neatly)
- B. Place record book pages under the proper tabs.
- *C. Check in livestock and crops pages that do not relate to your program.
- D. Bring leadership activities up to date.
- E. Bring diary up to date.
- F. Fill in depreciation schedule of machinery and equipment. (See Supplemental Information Sheet #2)
- *G. Fill in depreciation schedule of breeding livestock. (See Supplemental Information Sheet #3)
- H. Fill in depreciation schedule of personal items. (See Supplemental Information Sheet #4)
- I. Fill in beginning inventory of receivables and payables. (See Supplemental Information Sheet #5 & #6)
- *J. Fill in beginning inventory of crops, supplies, land and others. See Supplemental Information Sheet #5 & #7)
- K. Fill in beginning inventory of livestock. (See Supplemental Information Sheet #5 & #8)
- L. Fill in beginning of year values on Net Worth Statement. (Advanced students be sure to include previous years net worth to show progress. See Supplemental Information Sheet #9)
- M. Complete plans for long time farming program or the description of cooperating business.
- N. Complete the farming program agreement or the memorandum of training plan for the current year.
- O. Bring record of occupational skills up to date.
- P. Bring service record up to date.
- Q. Bring Ag Mechanics Activities records up to date.
- R. Record any Income, Business Expenses and Personal Expenses.
- *S. Bring forward from old records any information necessary for livestock breeding and feeding.

*T. Transfer from the old records the map of land operated information and crop information on enterprises that have not been harvested.

(NOTE: Remember to keep this record book up to date.)

*These items will not apply to the Agri-Business Record Books.

II. Record Book Grade Sheet

NAME: ____________________

RECORD BOOK GRADE SHEET

Grading Period									
LIVESTOCK RECORDS Breeding									
Feeding									
Cost Analysis									
Home Use									
Mortality									
Dairy Cow Records									
Poultry Records									
CROPS RECORDS Map									
Field Operations									
Practices									
Production Records									
Supply & Disposal									
Crop Analysis									
GRADE									

NAME: ______________________

RECORD BOOK GRADE SHEET

Grading Period												
RECORD BOOK ORGANIZATION												
RECORD BOOK NEATNESS												
LEADERSHIP												
Officers & Committee												
Awards & Recognition												
Leadership Act. by FFA												
School & Community Act.												
SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS												
Dairy												
Program Pictures												
Plans for Program												
Agreement												
Occupational Skills												
Description of Business												
AG MECHANICS												
Service Record												
Mechanics Activites												
INCOME												
BUSINESS EXPENSES												
PERSONAL EXPENSES												
CASH FLOW												
BOOK BALANCED												
DEPRECIATION												
Machinery & Equipment												
Breeding Livestock												
Personal Items												
INVENTORY OF RECEIVABLES AND PAYABLES												
INVENTORY OF CROPS & SUPPLIES												
INVENTORY OF LIVESTOCK												
NET WORTH STATEMENT												
OPERATING STATEMENT												
GRADE												

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KEY OF REMARKS FOR RECORD BOOK GRADE SHEET

MARK	KEY	
✓	OK	
/	First Noted (incomplete or incorrect)	-5
X	Second Noted (incomplete or incorrect)	-10
⊗	Third Noted (incomplete or incorrect)	-20
	Fourth Noted (BOOK WILL NOT BE ACCEPTED)	

SALVAGE VALUES AND DEPRECIATION METHODS

A. Salvage Value

1. Salvage value is the amount the farmer estimates he will receive from the permanent removal of an asset from the farm business.
2. Purpose of Savage Values -- The purpose of salvage values is to provide the farmer with a means for salvaging some of his investment. Salvage value influences the amount of capital gains or losses on an asset when it is permanently removed from the business.
3. Determination of Salvage -- Since salvage value is an estimated amount it is closely correlated with the individual practices of the farmer, i.e., if a farmer disposes of assets while they are in good working conditions, the salvage value should be a substantial amount. On the other hand, if he uses an asset for its entire useful life, the salvage value should be no more than junk price.
4. If a depreciable item has a salvage value of less than 10% of the cost when acquired, you can ignore the salvage value in determining the annual depreciation.

B. Depreciation

1. Purpose -- The purpose of depreciation deduction is to let the farmer recover his investment in depreciable property. It is the recovery of capital invested in purchased livestock, power, machinery, equipment, buildings, and improvements.
2. Methods of Depreciation
   a. Straight Line Method -- Subtract any salvage value from the original cost and divide the balance by the number of years of estimated life. For example, the beginning depreciable balance of a machine costing $7,500 with an estimated salvage value of $500 after ten years is $7,000. Simplicity and convenience are chief advantages of this method. (NOTE: Salvage value need not be subtracted, if it is less than 10% of the original cost. Either way, further depreciation cannot be taken after salvage value is reached.)

   b. Diminishing or Declining Balance Method -- With this method a constant percentage (up to twice the normal straight line rate) of the remaining value is taken for depreciation every year. Estimate salvage value, but do not subtract from the cost. For example, if a new machine is depreciated at 20% per year, first year's depreciation is $1,500. The second year's depreciation is $1,200 (20%

Ag. II - 32-C

of $6,000), the third year's is $960 (20% of $4,800) and so on, unitl the estimated salvage value is reached. Then no more depreciation may be taken. This method reflects actual market value closely, and more accurate evaluation of assets on the net worth is possible. Depreciation is heaviest when the equipment is new, lowering taxable income and freeing extra dollars to pay for the equipment. Higher repair bills offset lower depreciation as machines become older and help keep total maintenance costs more even over the life of the machine.

c. Sum-of-the-Years-Digits Method -- This method is somewhat similar to declining balance, but takes salvage value into account at the beginning. A $7,500 machine with a useful life of ten years and a salvage value of $500 is depreciated this way: Add up the sum-of-the-years -- in this case 10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 55. The first year take 10/55 of $7,000 or $1,273. The second year take 9/55 of $7,000 or $1,145 and so on until the entire $7,000 is used up. For easier figuring, divide beginning depreciable balance by the sum-of-the-years -- in this case $7,000 ÷ 55 = 127. Multiply this figure by the remaining years of life for the machine -- for example: 10 x 127, 9 x 127, 8 x 127, etc.

3. Depreciation Strategy

   a. As a general guide, take advantage of rapid depreciation methods. In effect, rapid depreciation is receiving an interest free loan from the government.

   b. Rarely today does a progressive farmer ever reach a leveling off in capital investment, he must continue to purchase new labor saving devices and higher capacity facilities and equipment.

   c. Declining balance and sum-of-the-years-digits provide the methods of writing off the depreciation faster than under the straight line at about two-thirds of the cost during the first one-half of the life.

   d. The declined balance method levels out after the fifth year. Thus it is advantageous to switch to the straight line method at that time to continue to gain depreciation.

   e. Actual depreciation is closest to accelerated depreciation.

INFORMATION SHEET #2

DEPRECIATION SCHEDULE

Ag. II - 33-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
Original cost — include the total cost of item if owned in partnership.
Va[illegible]my share — original cost x % ownership

Type of Assets MACHINERY & EQUIPMENT
(Personal, Machinery Purchased, Breeding Livestock)

								TOTAL
Description		PIG SELF FEEDER	PIG WATERER	PIG FENCING	PIG FEEDER			
Identification Number								
Date Acquired		9/20/76	11/1/76	1/15/77	2/5/77			
Original Cost or Other Basis		80 --	35 --	35 50	60 --			
Years of Life		10	10	10	10			
Depreciation Method		SL	SL	SL	SL			
% Ownership		100%	100%	100%	100%			
Value My Share		80 --	35 --	35 50	60 --			
Investment Credit Claimed		8 --	3 50	3 55	6 --			
20% First Year Depreciation		-0 -	-0 -	-0 -	-0 -			
Salvage Value		20 --	5 --	5 50	15 --			25 --
Annua[illegible]eciation (if straight line)		6 --	3 --	3 --	4 50			
Depreciation Claimed in Prior Years		1 50	50	-0 -	-0 -			
Depreciable Balance		58 50	29 50	30 --	45 --			88 --
Year 1977	Depreciation Taken	6 --	3 --	3 --	3 75			
	Depreciable Balance	52 50	26 50	27 --	41 25			
Year ______	Depreciation Taken							
	Depreciable Balance							
Year ______	Depreciation Taken							
	Depreciable Balance							
Year ______	Depreciation Taken							
	Depreciable Balance							
Year ______	Depreciation Taken							
	Depreciable Balance							
Year ______	Depreciation Taken							
	Depreciable Balance							
Year ______	Depreciation Taken							
	Depreciable Balance							

SUPPLEMENTAL
INFORMATION
SHEET #3

DEPRECIATION SCHEDULE

Ag. II - 35-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
Original cost — include the total cost of item if owned in partnership.
V[illegible] my share — original cost x % ownership

Type of Assets Breeding Livestock
(Personal, Machinery Purchased, Breeding Livestock)

									TOTAL
Description		Duroc. Sow	Reg. Hamp. Gilt	Reg. Hamp. Boar					
Identification Number									
Date Acquired		6/30/75	1/10/77	2/15/77					
Original Cost or Other Basis		80 00	100 00	150 00					
Years of Life		3	4	2					
Depreciation Method		SL	SL	SL					
% Ownership		100%	100%	100%					
Value My Share		80 00	100 00	150 00					
Investment Credit Claimed									
20% First Year Depreciation		-0-	-0-	-0-					
Salvage Value		20 00	60 00	100 00					
Annu[illegible]eciation (if straight line)		20 00	10 00	25 00					
Depreciation Claimed in Prior Years		30 00	-0-	-0-					
Depreciable Balance		30 00	40 00	50 00					
ear 77	Depreciation Taken	-0-	10 00	22 00					
	Depreciable Balance	Sold 1/3/76	30 00	28 00					
Year	Depreciation Taken								
	Depreciable Balance								
Year	Depreciation Taken								
	Depreciable Balance								
Year	Depreciation Taken								
	Depreciable Balance								
ear	Depreciation Taken								
	Depreciable Balance								
Year	Depreciation Taken								
	Depreciable Balance								
Year	Depreciation Taken								
	Depreciable Balance								

SUPPLEMENTAL
INFORMATION
SHEET #4

DEPRECIATION SCHEDULE

Ag. II - 37-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
Original cost — include the total cost of item if owned in partnership.
Value my share — original cost x % ownership

Type of Assets Personal
(Personal, Machinery Purchased, Breeding Livestock)

								TOTAL
1	Description	Digital Timex Watch	Bar Bell Set & Wght Lifting Bench	Glenfield 20 w/Pow Scope	Unitrex Calculator	Sears Tape Player		xxx
2	Identification Number							xxx
3	Date Acquired	12/25/75	7/1/76	10/1/76	1/25/77	2/27/77		xxx
4	Original Cost or Other Basis	40 00	60 00	46 95	20 00	75 00		
5	Years of Life	5	10	20	5	10		xxx
6	Depreciation Method	SL	SL	SL	SL	SL		xxx
7	% Ownership	100%	100%	100%	100%	100%		xxx
8	Value My Share	40 00	60 00	46 95	20 00	75 00		xxx xx
9	Investment Credit Claimed	-0 -	-0 -	-0 -	-0 -	-0 -		
10	20% First Year Depreciation	-0 -	-0 -	-0 -	-0 -	-0 -		
11	Salvage Value	-0 -	20 00	16 95	-0 -	15 00		
12	Annual Depreciation (if straight line)	8 00	4 00	1 50	4 00	6 00		xxx xx
13	Depreciation Claimed in Prior Years	8 00	2 00	38	-0 -	-0 -		xxx xx
14								xxx xx
15								xxx xx
16	Depreciable Balance	32 00	38 00	29 62	20 00	60 00		
17	Year 77 Depreciation Taken							
18	Depreciable Balance							
19	Year ______ Depreciation Taken							
20	Depreciable Balance							
21	Year ______ Depreciation Taken							
22	Depreciable Balance							
23	Year ______ Depreciation Taken							
24	Depreciable Balance							
25	Year ______ Depreciation Taken							
26	Depreciable Balance							
27	Year ______ Depreciation Taken							
28	Depreciable Balance							
29	Year ______ Depreciation Taken							
30	Depreciable Balance							

INVENTORIES

Methods of Valuation:

1. One problem in making annual inventories is arriving at a value for the various farm products and property.
2. Inventory practices should be consistent from year to year or the value of the annual inventory is lost. If values are adjusted unrealistically from year to year, true progress is not determined.
3. The Internal Revenue Service and your credit needs will have an influence on the method of valuation you will select to use.
4. Four methods which may be used in valuation of inventory items:
    a. Cost Method -- Supplies of fertilizer, purchased feeds, and other materials to be used in production are normally valued at cost. Raised inventory items may be valued at the cost of producing them. Purchased feeder livestock are valued at the actual purchase price plus any additional costs which add to the value of the livestock.

    b. Farm Price Method -- Market livestock, poultry and unsold crops may be valued by the farm price method. With this method, each item (whether raised or purchased) is valued at the market price minus sales cost. For purposes of analysing the farm business this method is most useful.

    c. Unit-Livestock-Price Method -- Raised livestock may be valued with this method. Under this method, livestock is grouped or classified according to kind and age and a standard price is used for each animal within a class or group. An example would be all calves - $80; yearlings - $125 and mature cows - $200. See Farmers Tax Guide for more information on this method.

    d. Cost-Less-Depreciation Method -- Livestock purchased for breeding or dairy purposes are valued with this method. Under this method, the value each year becomes the remaining cost of the previous year less the depreciation allowed for the year. This is the method prescribed by the Internal Revenue Service for tax purposes. For example: if a bull is purchased for $800 and a salvage value of $200 is set aside, the depreciable balance is $600. If the extimated life is four years, the depreciation would be $150 each year. The value at the end of the first year would be $650 ($800 purchase cost minus $150 annual depreciation) and at the end of the second year $500 ($650 minus $150).

INVENTORY OF RECEIVABLES AND PAYABLES

Year 1977

Receivables

	Cash Receivables	Beginning of Year	End of Year
1	Cash on Hand	10 --	
2	Checking accounts (less outstanding checks)	240 50	
3			
4			
5	Totals Cash Receivables	250 50	
		A	

	Accounts Receivable Persons Who Owe Me	Date Due	Interest Rate	Beginning Accounts	New Accounts	Received on old Year	End of Year
6	Savings		5%	750 —			
7	HILL CITY FFA WHEAT SHARE			5 —			
8							
9	People who owe me DAD			50 —			
10	Bonds, stocks, etc						
11							
12	Totals Accounts Receivable			805 --			
	Column A plus B minus C equal D			A	B	C	D

Payables

Accounts Payable

	Persons I owe	Date Due	Interest Rate	Beginning of Year	New Accounts	Paid on old Account	End of Year
13	Taxes						
14	Rent						
15	Charge accounts and businesses, feed, supplies, etc						
16							
17							
18							
19							
20							
21							
22	Total Accounts Payable						
	Column A plus B minus C equal D			A	B	C	D

INVENTORY OF CROPS, SUPPLIES, LAND & OTHER

Line No	CROPS, GRAINS, FEEDS	BEGINNING OF YEAR (77)				END OF YEAR (___) BEGINNING OF YEAR (___)				END OF YEAR (___) BEGINNING OF YEAR (___)				END OF YEAR (___) BEGINNING OF YEAR (___)			
		Qnt	Price Per Unit	Value		Qnt	Price Per Unit	Value		Qnt	Price Per Unit	Value		Qnt.	Price Per Unit	Value	
1	[illegible]			[illegible]0	—												
[illegible]																	
[illegible]																	
[illegible]																	
[illegible]																	
6																	
7																	
8																	
9																	
10	Barley																
11	Protein																
12	Sorghum Silage																
13	Total Grains and Feeds	xxx	xxx	450	—	xxx	xxx			xxx	xxx			xxx	xxx		
14	Seeds																
15	Milo Seed																
16																	
17																	
18	Total Seeds	xxx	xxx			xxx	xxx			xxx	xxx			xxx	xxx		
19	Supplies																
20	Fertilizer																
21	Gas, Fuel, Oil																
22	Seeded Wheat	10	15/ac	150	—												
23	(acres)																
24	Total Supplies	xxx	xxx	150	—	xxx	xxx			xxx	xxx			xxx	xxx		
25	Owned Land																
26																	
27	Rented Land acres	20	xxx	xxx	xx		xxx	xxx	xx		xxx	xxx	xx		xxx	xxx	
28	Total Land acres	20	xxx	-0	-		xxx				xxx				xxx		
29	Other																
30																	
31																	
32																	
33	Total Other	xx	xxx				xxx	xxx		xxx	xxx			xxx	xxx		
		1	2	3		4	5	6		7	8	9		10	11	12	

INVENTORY OF LIVESTOCK

Ag. II - 45-C

	Livestock Description	BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)			
		No.	Total Weight	Total Value		No	Total Weight	Total Value		No	Total Weight	Total Value		No	Total Weight	Total Value	
	Beef - Cows																
2	Other Breeding-Beef*																
3	Heifers																
4																	
5																	
6																	
7																	
8	Market Cattle																
9	Feeder Calves																
10																	
11	Total Beef Cattle																
12	Dairy-Cows																
13	Other Dairy Breeding*																
14	Heifers																
15																	
16																	
17																	
18	Total Dairy Cattle																
19	Swine-Sows																
20	Other Breeding Swine *	1	350	50	--												
21																	
22																	
2																	
24	Market Hogs	10	1800	540	--												
25																	
26	Fall Pigs																
27	Total Swine	11	2150	590	--												
28	Sheep, Ewes																
29	Others																
30	Breeding Sheep*																
31																	
32	Rams																
33																	
34																	
35																	
36																	
37																	
38	Market Lambs																
39	Total Sheep																
40	Poultry-Hens																
41																	
42	Pullets																
43	Total Poultry																
44	Other																
45																	
46	Total Other																
47	Other																
48																	
49	Total Other																
		1	2	3		4	5	6		7	8	9		10	11	12	

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SUPPLEMENTAL INFORMATION SHEET #9

NET WORTH STATEMENT

Net worth measures financial progress. Basically, it's the amount of cash you would have left over if you sold everything you own and then paid off all bills, notes and mortgages; it's total assets minus total liabilities. After the inventory is completed, assests and liabilities can then be systematically recorded to obtain the net worth statement. The net worth statement lets you see at a glance where you stand financially at years end.

Knowing net worth is important for:

1. Getting loans
2. Your own satisfaction in knowing true progress
3. Setting up partnerships or incorporating
4. Measuring over-all management ability
5. Indicates the solvency of the business. (A low net worth or a negative net worth figure would indicate real danger to the business and it's creditors.)

A net worth figure is only as good as the figures that make it up. Figuring changes in assets, liabilities and net worth helps you see what progress you are making. The net worth statement can help provide solutions to many farm management problems and is essential in obtaining credit. Credit is becoming more and more vital as a farm tool, and being ready to face up to informational needs of creditors is part of today's farming.

Of course, credit is not extended in the basis of exact figures and ratios alone. Management ability is still the most significant factor ... but having facts and figures readily available is one of the best ways to show that ability. The man with the figures may get loans easier than one who is in a stronger position, but who cannot back it up. Caution: The man with faulty figures may get his loan, then wish he had not.

Use net worth statement and financial ratios in your management decisions. Know where you really stand, and you'll know how to get where you want to be.

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

ASSIGNMENT SHEET #1 -
STEPS TO FOLLOW IN OPENING YOUR NEW RECORD BOOK

Complete the following check list:

Check When
Completed

_____ 1. Fill in name and year on cover page in ink. (Print neatly)

_____ 2. Place record book pages under the proper tabs.

_____ *3. Check in livestock and crops pages that do not relate to your program.

_____ 4. Bring leadership activities up to date.

_____ 5. Bring diary up to date.

_____ 6. Fill in depreciation schedule of machinery and equipment.

_____ *7. Fill in depreciation schedule of breeding livestock.

_____ 8. Fill in depreciation schedule of personal items.

_____ 9. Fill in beginning inventory of receivables and payables.

_____*10. Fill in beginning inventory of crops, supplies, land, and others.

_____ 11. Fill in beginning inventory of livestock.

_____ 12. Fill in beginning of year values on Net Worth Statement. (Advanced students be sure to include previous years net worth to show progress.)

_____ 13. Complete plans for long time farming program or the description of cooperating business.

_____ 14. Complete the farming program agreement or the memorandum of training plan for the current year.

_____ 15. Bring record of occupational skills up to date.

_____ 16. Bring service record up to date.

_____ 17. Bring Ag. Mechanics Activities records up to date.

_____ 18. Record and Income, Business Expenses, and Personal Expenses.

_____*19. Bring forward from old records any information necessary for livestock breeding and feeding.

_____*20. Transfer from the old records the map of land operated information and crop information on enterprises that have not been harvested.

NOTE: REMEMBER TO KEEP THIS RECORD BOOK UP TO DATE!

* These items will not apply to the Agri-Business Record Book.

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

INSTRUCTIONS FOR
ASSIGNMENT SHEETS 2, 3, 4, 5. 6, & 7

Complete the following assingment sheet for your own record book. On assignment sheets #2, #3, & #4 be sure and note the type of asset in the upper right hand corner.

ASSIGNMENT SHEET #2

DEPRECIATION SCHEDULE

Ag. II - 53-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
Original cost — include the total cost of item if owned in partnership.
alue my share — original cost x % ownership

Type of Assets Machinery & Equipment
(Personal, Machinery Purchased, Breeding Livestock)

							TOTAL	
1 Description							xxx	
2 Identification Number							xxx	
3 Date Acquired							xxx	
4 Original Cost or Other Basis								
5 Years of Life							xxx	
6 Depreciation Method							xxx	
7 % Ownership							xxx	
8 Value My Share							xxx	xx
9 Investment Credit Claimed								
10 20% First Year Depreciation								
11 Salvage Value								
1 nual Depreciation (if straight line)							xxx	xx
13 Depreciation Claimed in Prior Years							xxx	xx
14							xxx	xx
15							xxx	xx
16 Depreciable Balance								
17 Year _______ Depreciation Taken								
18 Depreciable Balance								
19 Year _______ Depreciation Taken								
20 Depreciable Balance								
21 Year _______ Depreciation Taken								
22 Depreciable Balance								
23 Year _______ Depreciation Taken								
24 Depreciable Balance								
25 Year _______ Depreciation Taken								
26 Depreciable Balance								
27 ar _______ Depreciation Taken								
2 Depreciable Balance								
29 Year _______ Depreciation Taken								
30 Depreciable Balance								

ASSIGNMENT SHEET #3

DEPRECIATION SCHEDULE

Ag. II - 55-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
Original cost — include the total cost of item if owned in partnership.
alue my share — original cost x % ownership

Type of Assets Breeding Livestock
(Personal, Machinery Purchased, Breeding Livestock)

								TOTAL	
1	Description							xxx	
2	Identification Number							xxx	
3	Date Acquired							xxx	
4	Original Cost or Other Basis								
5	Years of Life							xxx	
6	Depreciation Method							xxx	
7	% Ownership							xxx	
8	Value My Share							xxx	xx
9	Investment Credit Claimed								
10	20% First Year Depreciation								
11	Salvage Value								
1	nual Depreciation (if straight line)							xxx	xx
13	Depreciation Claimed in Prior Years							xxx	xx
14								xxx	xx
15								xxx	xx
16	Depreciable Balance								
17	Year ____ Depreciation Taken								
18	Depreciable Balance								
19	Year ____ Depreciation Taken								
20	Depreciable Balance								
21	Year ____ Depreciation Taken								
22	Depreciable Balance								
23	Year ____ Depreciation Taken								
24	Depreciable Balance								
25	Year ____ Depreciation Taken								
26	Depreciable Balance								
27	ar ____ Depreciation Taken								
2	Depreciable Balance								
29	Year ____ Depreciation Taken								
30	Depreciable Balance								

ASSIGNMENT SHEET #4

DEPRECIATION SCHEDULE

Ag. II - 57-C

Breeding livestock — remaining balance plus salvage value is transferred to inventory pages
iginal cost — include the total cost of item if owned in partnership.
Value my share — original cost x % ownership

Type of Assets Personal
(Personal, Machinery Purchased, Breeding Livestock)

									TOTAL
1	Description								xxx
2	Identification Number								xxx
3	Date Acquired								xxx
4	Original Cost or Other Basis								
5	Years of Life								xxx
6	Depreciation Method								xxx
7	% Ownership								xxx
8	Value My Share								xxx xx
9	Investment Credit Claimed								
10	20% First Year Depreciation								
	lvage Value								
12	Annual Depreciation (if straight line)								xxx xx
13	Depreciation Claimed in Prior Years								xxx xx
14									xxx xx
15									xxx xx
16	Depreciable Balance								
17	Year ______	Depreciation Taken							
18		Depreciable Balance							
19	Year ______	Depreciation Taken							
20		Depreciable Balance							
21	Year ______	Depreciation Taken							
22		Depreciable Balance							
23	Year ______	Depreciation Taken							
24		Depreciable Balance							
25	Year ______	Depreciation Taken							
26		Depreciable Balance							
	ear ______	Depreciation Taken							
28		Depreciable Balance							
29	Year ______	Depreciation Taken							
30		Depreciable Balance							

ASSIGNMENT SHEET #5

Ag. II - 59-C

INVENTORY OF RECEIVABLES AND PAYABLES

Year ______

Receivables

Cash Receivables	Beginning of Year	End of Year
1 Cash on Hand		
2 Checking accounts (less outstanding checks)		
3		
4		
5 Totals Cash Receivables		
	A	

Accounts Receivable Persons Who Owe Me	Date Due	Interest Rate	Beginning Accounts	New Accounts	Received on old Year	End of Year
6 Savings						
7						
8						
9 People who owe me						
10 Bonds, stocks, etc						
11						
12 Totals Accounts Receivable						
Column A plus B minus C equal D			A	B	C	D

Payables

Accounts Payable Persons I owe	Date Due	Interest Rate	Beginning of Year	New Accounts	Paid on old Account	End of Year
13 Taxes						
14 Rent						
15 Charge accounts and businesses, feed, supplies, etc.						
16						
17						
18						
19						
20						
21						
22 Total Accounts Payable						
Column A plus B minus C equal D			A	B	C	D

ASSIGNMENT SHEET #6

Ag. II - 61-C

INVENTORY OF CROPS, SUPPLIES, LAND & OTHER

						END OF YEAR (___)				END OF YEAR (___)				END OF YEAR (___)			
		BEGINNING OF YEAR (___)				BEGINNING OF YEAR (___)				BEGINNING OF YEAR (___)				BEGINNING OF YEAR (___)			
Line No.	CROPS, GRAINS, FEEDS	Qnt	Price Per Unit	Value		Qnt	Price Per Unit	Value		Qnt	Price Per Unit	Value		Qnt	Price Per Unit	Value	
1	Wheat																
2																	
3																	
4	Corn																
5																	
6																	
7																	
8																	
9																	
10	Barley																
11	Protein																
12	Sorghum Silage																
13	Total Grains and Feeds	xxx	xxx			xxx	xxx			xxx	xxx			xxx	xxx		
14	Seeds																
15	Milo Seed																
16																	
17																	
18	Total Seeds	xxx	xxx			xxx	xxx			xxx	xxx			xxx	xxx		
19	Supplies																
20	Fertilizer																
21	Gas, Fuel, Oil																
22																	
23																	
24	Total Supplies	xxx	xxx			xxx	xxx			xxx	xxx			xxx	xxx		
25	Owned Land																
26																	
27	Rented Land		xxx	xxx	xx		xxx	xxx	xx		xxx	xxx	xx		xxx	xxx	
28	Total Land		xxx				xxx				xxx				xxx		
29	Other																
30																	
31																	
32																	
33	Total Other	xx	xxx				xxx	xxx		xxx	xxx			xxx	xxx		
		1	2	3	4		5	6		7	8	9		10	11		12

INVENTORY OF LIVESTOCK

Ag. 11 - 63-C

		BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)				END OF YEAR (____) BEGINNING OF YEAR (____)			
	Livestock Description	No	Total Weight	Total Value		No.	Total Weight	Total Value		No	Total Weight	Total Value		No	Total Weight	Total Value	
1	Beef - Cows																
2	Other Breeding-Beef*																
3	Heifers																
4																	
5																	
6																	
7																	
8	Market Cattle																
9	Feeder Calves																
10																	
11	Total Beef Cattle																
12	Dairy-Cows																
13	Other Dairy Breeding*																
14	Heifers																
15																	
16																	
17																	
18	Total Dairy Cattle																
19	Swine-Sows																
20	Other Breeding Swine																
21																	
22																	
23																	
24	Market Hogs																
25																	
26	Fall Pigs																
27	Total Swine																
28	Sheep, Ewes																
29	Others																
30	Breeding Sheep*																
31																	
32	Rams																
33																	
34																	
35																	
36																	
37																	
38	Market Lambs																
39	Total Sheep																
40	Poultry-Hens																
41																	
42	Pullets																
43	Total Poultry																
44	Other																
45																	
46	Total Other																
47	Other																
48																	
49	Total Other																
			1	2	3		4	5	6		7	8	9		10	11	12

*Total from depreciation page including salvage value

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

ASSIGNMENT SHEET #8
RECORD BOOK GRADE SHEET

Have the following grade sheet completed: NAME: ____________

Grading Period										
LIVESTOCK RECORDS Breeding										
Feeding										
Cost Analysis										
Home Use										
Mortality										
Dairy Cow Records										
Poultry Records										
CROPS RECORDS Map										
Field Operations										
Practices										
Production Records										
Supply & Disposal										
Crop Analysis										
GRADE										

MARK	KEY	
✓	OK	
/	First Noted (incomplete or incorrect)	-5
✕	Second Noted (incomplete or incorrect)	-10
⊗	Third Noted (incomplete or incorrect)	-20
	Fourth Noted (BOOK WILL NOT BE ACCEPTED)	

Ag. II - 66-C

NAME: ____________________

RECORD BOOK GRADE SHEET

Grading Period												
RECORD BOOK ORGANIZATION												
RECORD BOOK NEATNESS												
LEADERSHIP												
Officers & Committee												
Awards & Recognition												
Leadership Act. by FFA												
School & Community Act.												
SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS												
Dairy												
Program Pictures												
Plans for Program												
Agreement												
Occupational Skills												
Description of Business												
AG. MECHANICS												
Service Record												
Mechanics Activities												
INCOME												
BUSINESS EXPENSES												
PERSONAL EXPENSES												
CASH FLOW												
BOOK BALANCED												
DEPRECIATION												
Machinery & Equipment												
Breeding Livestock												
Personal Items												
INVENTORY OF RECEIVABLES AND PAYABLES												
INVENTORY OF CROPS & SUPPLIES												
INVENTORY OF LIVESTOCK												
NET WORTH STATEMENT												
OPERATING STATEMENT												
GRADE												

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

TEST

1. All assignments should be completed to the satisfaction of the instructor. If they have not been completed they should be completed at this time.

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

TERMINAL OBJECTIVES

After completion of this unit the student should be able to demonstrate his or her ability to complete his or her Kansas Vocational Agriculture Record Book and prepare the book for the next year. This knowlegde will be evidenced by completing the record book with all business figures 100 percent accurate and receiving an 85 percent on the record book grade sheet.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Complete all appropriate pages for current year
2. Complete a Record Book accuracy check.
3. Complete Record Book summary sheet.

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

INFORMATION SHEET

I. Appropriate pages should be completed through following steps to close out record book

*A. Complete Crop Record Pages. Be sure crop analysis have been completed for all harvested crops. All current years expenses should be transferred to business expense page. Record an equal amount on income page as exchange for labor if not actually paid.

*B. Complete the livestock feed records for current year.

C. Fill in End of Year Inventory of Receivables and Payables.

D. Fill in Depreciation Schedule for Machinery & Equipment purchased during current year and calculate depreciable balance for beginning of new year for all items.

*E. Fill in Depreciation Schedule for purchased Breeding Livestock during current year and calculate depreciable balance as before.

F. Fill in Depreciation Schedule for personal capital purchases for current year and calculate deprecialbe balance as before.

*G. Fill in End of year Inventory of Livestock. Be sure to use depreciable balance plus salvage value for all breeding animals on the depreciation schedule.

*H. Fill in End of year Inventory of Crops, Supplies, Land, and Other.

I. Complete Income, Business Expenses and Personal Expenses.

J. Complete Cash Balance for December 31. Be sure Line 8 and 9 are the same. (See TM 1)

K. Complete Cash Flow Statement.

L. Complete Operating Statement. (Profit and Loss)

M. Complete End of Year Net Worth Statement.

*N. Complete Livestock Record--Supply & Disposal and Profit Guides.

*O. Complete Livestock Cost Analysis pages for each livestock Enterprise.

*P. Complete any other livestock records pertaining to your program. (Breeding, Poultry, Dairy, etc.)

*Q. Fill in completed program on plans for Long Time Farming Program.

R. (Any additional steps should be added here.)

S. Fill in Vocational-Agriculture Record Book Summary Sheet.

(Refer to Assignment Sheet #2 & TM 2)

* These items will not apply to the Agri-Business Record Book.

II. Record Book Accuracy Check

KANSAS VOCATIONAL AGRICULTURE RECORD BOOK

ACCURACY CHECK

NAME: (Sample) DATE: June 11, 1980

CASH BALANCE

1.	Cash on Hand at Beginning of Year (Inventory receivables, Col. A, Line 5)		$ 250.50	
2.	Cash Received (Income pages, Col. A)		$2224.50	
3.	Total Money Available to Spend (1 plus 2)			$2475.00
4.	Business Expenses (Col. A)		$1988.50	
5.	Personal Expenses			
	a. Auto-Transportation	$ 55.00		
	b. Recreation	$ 15.50		
	c. Capital Purchases	$ 95.00		
	d. Education	$ 58.75		
	e. Contributions	$ 2.00		
	f. Medical	$ 7.00		
	g. Other Personal Items	$ 27.00		
6.	Total Personal Expenses (5)		$ 260.25	
7.	Total Expenses (4 plus 6)			$2248.75
8.	Balance on Hand (3 minus 7)			$ 226.25
9.	Actual Amount on Hand			$ 225.00
10.	Unaccounted Expenses (8 minus 9)			$ 1.25
11.	Unaccounted Income (9 minus 8)			$ -0-

KANSAS VOCATIONAL AGRICULTURE RECORD BOOK

ACCURACY CHECK

NAME: ______________________ DATE: ______________________

CASH BALANCE

1. CASH ON HAND AT BEGINNING OF YEAR (INVENTORY RECEIVABLES, COL. A, LINE 5) $______

2. CASH RECEIVED (INCOME PAGES, COL. A) $______

3. TOTAL MONEY AVAILABLE TO SPEND (1 PLUS 2) $______

4. BUSINESS EXPENSES (COL. A) $______

5. PERSONAL EXPENSES

   A. AUTO-TRANSPORTATION $______

   B. RECREATION $______

   C. CAPITAL PURCHASES $______

   D. EDUCATION $______

   E. CONTRIBUTIONS $______

   F. MEDICAL__________ $______

   G. OTHER PERSONAL ITEMS $______

6. TOTAL PERSONAL EXPENSES (5) $______

7. TOTAL EXPENSES (4 PLUS 6) $______

8. BALANCE ON HAND (3 MINUS 7) $______

9. ACTUAL AMOUNT ON HAND $______

10. UNACCOUNTED EXPENSES (8 MINUS 9) $______

11. UNACCOUNTED INCOME (9 MINUS 8) $______

NAME ____________________

Vo-Ag Record Book Summary

NET WORTH: BEGINNING OF YEAR $__________ END OF YEAR $__________

NET FARM INCOME: ACCRUAL BASIS $________ CASH BASIS $__________

LIVESTOCK ENTERPRISES	NUMBER	NET INCOME	HOURS LABOR

CROP ENTERPRISES	ACRES	NET INCOME	HOURS LABOR

WORK EXPERIENCE: HOURS LABOR ________________ INCOME $__________

LIST FUTURE AG EXPERIENCE PROGRAM PLANS:

RECORD KEEPING - CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

ASSIGNMENT SHEET #1
STEPS TO FOLLOW IN CLOSING OUT RECORD BOOK

Complete the following check list:

Check When
Completed

_____ *1. Complete Crop Record Pages. Be sure crop analysis have been completed for all harvested crops. All current years expenses should be transferred to business expense page. Record an equal amount on income page as exchange for labor if not actually paid.

_____ *2. Complete the livestock feed records for current year.

_____ 3. Fill in End of Year Inventory of Receivable and Payables.

_____ 4. Fill in Depreciation Schedule for Machinery & Equipment purchased during current year and calculate depreciable balance for beginning of new year for all items.

_____ *5. Fill in Depreciation Schedule for purchased Breeding Livestock during current year and calculate depreciable balance as before.

_____ 6. Fill in Depreciation Schedule for personal capital purchases for current year and calculate depreciable balance as before.

_____ *7. Fill in End of Year Inventory of Livestock. Be sure to use depreciable balance plus salvage value for all breeding animals on the depreciation schedule.

_____ *8. Fill in End of Year Inventory of Crops, Supplies, Land, and Other.

_____ 9. Complete Income, Business Expenses, and Personal Expenses.

_____ 10. Complete Cash Balance for December 31. Be sure Lines 8 and 9 are the same.

_____ 11. Complete Cash Flow Statement.

_____ 12. Complete Operating Statement. (Profit and Loss)

_____ 13. Complete End of Year Net Worth Statement.

_____ *14. Complete Livestock - Supply & Disposal and Profit Guides.

_____ *15. Complete Livestock Cost Analysis pages for each livestock Enterprise.

_____ *16. Complete any other livestock records pertaining to your program. (Breeding, Poultry, Dairy, etc.)

_____*17. Fill in completed program on Plans for Long Time Farming Program.

_____ 18. (Additional steps should be added here.)

_____ 19. Fill in Vocational-Agriculture Record Book Summary sheet.

* These items will not apply to the Agri-Business Record Book.

RECORD KEEPING-
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

ASSIGNMENT SHEET #2
KANSAS VOCATIONAL AGRICULTURE RECORD BOOK
ACCURACY CHECK

NAME: ______________________ DATE: ______________________

CASH BALANCE

1. Cash on Hand at Beginning of Year (Inventory receivables, Col. A, Line 5) $_______

2. Cash Received (Income pages, Col. A) $_______

3. Total Money Available to Spend (1 plus 2) $_______

4. Business Expenses (Col. A) $_______

5. Personal Expenses

   a. Auto-Transportation $_______

   b. Recreation $_______

   c. Capital Purchases $_______

   d. Education $_______

   e. Contributions $_______

   f. Medical ____________ $_______

   g. Other Personal Items $_______

6. Total Personal Expenses (5) $_______

7. Total Expenses (4 plus 6) $_______

8. Balance on Hand (3 minus 7) $_______

9. Actual Amount on Hand $_______

10. Unaccounted Expenses (8 minus 9) $_______

11. Unaccounted Income (9 minus 8) $_______

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

ASSIGNMENT SHEET #3
VO-AG RECORD BOOK SUMMARY

Complete the following summary form:

VO-AG RECORD BOOK SUMMARY

NET WORTH: Beginning of Year $________ End of Year $________

NET FARM INCOME: Accrual Basis $________ Cash Basis $________

LIVESTOCK ENTERPRISES	NUMBER	NET INCOME	HOURS LABOR

CROP ENTERPRISES	NUMBER	NET INCOME	HOURS LABOR

WORK EXPERIENCE: Hours Labor ________ Income $____________

LIST FUTURE AG EXPERIENCE PROGRAM PLANS:

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

TEST

1. All assignments should be completed to the satisfaction of the instructor. If they have not been completed they should be completed at this time.

PLANNING AND IMPLEMENTING SUPERVISED ON-JOB EXPERIENCE PROGRAMS FOR AGRIBUSINESS
UNIT IV

TERMINAL OBJECTIVE

After completion of this unit, the student should be able to select an agribusiness job from the various types of jobs available, establish goals for his/her four years in Vocational Agriculture, and set ways and means of reaching those goals. The students should be able to apply the fundamentals of beginning record keeping. Each student involved should complete the record book with all business figures 100 percent accurate. The information pages in the record book should be 90 percent accurate.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Describe the candidate occupational objective page and complete his/her own plan for his/her occupational objectives.
2. Complete his/her supervised occupational experience agreement.
3. Complete his/her plan for specific experiences to be gained.
4. Complete the sheet titled "Other Information" for agribusiness.
5. Complete the agribusiness record book to the teachers satisfaction.

INFORMATION SHEET

I. Candidate Occupational Objective

A. Example

Candidate Occupational Objective: to become the manager of the Uniontown Implement Sales and Repair Shop.

What it will take to reach this occupational objective	Plans for reaching occupational objectives	Extent of experience already received in reaching occupational objective
Experience Work in as many areas in this field so my training experiences will start me on my way towards my career goal of managership of the Implement Shop	Work for dealer in Uniontown while in high school during the school year and extend into summer employment	I am currently employed by the dealer in Uniontown and have set up a 4 year plan of experiences to be completed here and have an agreement with Mr. Smith for summer employment and after two years of Vo-Tech I plan to return as a mechanic in the shop
Education 2 years Vo-Tech and major in mechanics	Plan to attend Vo-Tech for 2 years and major in mechanics	Three months working for dealership
Cost $300.00 plus room and board	Save money earned while on the job to finance education	Earned $396 while in employment at shop (9/1 - 12/31) Saved
Other		

II. Supervised Occupational Experience Agreement

A. Replaces Farming Program Agreement page in record book

B. Example

Supervised Occupational Experience Agreement

Starting date:	9/1/79
Ending date:	8/21/80, with chance for employment while in Vo-Tech and also after completion of schooling
Hours:	2 hours after school each day with 8 hours on Saturday: 44 hours during summer each week with three weeks off
Wages:	start at $1.90 per hour with increase of $.05 per hour each two months up to $2.60 per hour while in school

Experiences:

1. Learn the responsibilities towards the company
    a. Attitude
    b. Communications
    c. Employee economics

2. Organization of shop area and tool storage

3. Learn to be a mechanic's helper and take directions

4. Procedures in loading and delivering machinery

5. Repair and assembling machinery problems

6. Learn to read repair and parts manuals, and locate parts in storage

7. Learn to start, keep and price a customer's bill

8. Learning to order parts and check in

9. Develop skills in salesmanship of products

III. Plan for specific experiences to be gained

A. Example

Specific experiences to be gained: indicate the specific experiences to be gained that will assist in achieving your desired career goal.

Occupational objective: Manager of a farm implement sales and repair shop

Name of business in which agribusiness experience is obtained	Specific Experience and/or Skills Developed	Indicate how each experience will assist you towards achieving your occupational goal
Uniontown Implement Sales and Repair Shop	1. Organization of shop area and tools	a. Realizing the value of a clean shop b. Understanding the value of proper tool location c. Training in organizing to repair shop

Ag. II - 100-C

IV. Other information

A. Example

Agribusiness
(course name)

9-2-79
(date)

Name Doe (last) John (first) L. (MI) Class Sr. Age 17

Address 600 Main Post Office Your town

Telephone Number 000-123-6010 Date of Birth 3-10-62

Social Security Number 211-61-5111 KS Drivers License # A 2N2E1

Father's Name Don Mother's Name May

Direction to Home if applicable 1200 Main

Father's Occupation Teacher Mother's Occupation Home

No. of Brothers 1 Number of Sisters 1

Agricultural experience (years) Agribusiness 3 Farm 0

Are you in 4-H No What FFA Degrees do you have Chapter farmer

List your class schudule on the back of this page

Agriculture Mechanics Work or Project Kind of Work	Agr. Sales and Services Kind of Work
Overhaul Lawn mower Picnic Table	Service man at Joe's Machinery

What is your occupational objective and occupational objective code? 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0199 0103

What are your plans after graduating from high school? Mechanic

Why did you enroll in this course? FFA leadership and knowledge of agriculture and mechanics

List previous courses taken in Vocational Agriculture I, II, III

Ag. II - 101-C

Name John Doe

CLASS SCHEDULE

PERIOD	1	2	3	4	5	6	7	8	9	10
TIME	8:15	9:12	10:10	11:07	12:40	1:37				
Monday	Gov.	Eng. IV	Vo-Ag IV	Sen. Math	Bus. Law	S.H.				
Tuesday	↓	↓	↓	↓	↓	↓				
Wednesday	↓	↓	↓	↓	↓	↓				
Thursday	↓	↓	↓	↓	↓	↓				
Friday	↓	↓	↓	↓	↓	↓				

ASSIGNMENT SHEET #1 - OCCUPATIONAL OBJECTIVE PAGE

NOTE: No supplemental pages are to be added except pages for photographs

Qualifying Programs: Programs that provide exploratory experiences and to develop occupational competencies needed by individuals preparing to enter the occupations of Sales and Service in off-farm agriculture. Experiences may be in feed and other farm supply stores, agricultural equipment dealerships, lumber and building supply stores, florist shops, garden centers and landscape maintenance firms (For more information on this program, please consult your chapter Agricultural Proficiency Award Guide.)

A. Applicant's Vocational Objective: (To be completed by the applicant) State your ultimate career goal and your plan for achieving this goal. This section will not be scored by the judges, its only purpose is to define the basis for the experiences you received through your experience program.

Candidate's occupational objective ______________________________

What it will take to reach this occupational objective	Plans for reaching occupational objective	Extent of experiences already received in reaching occupational objective
Experience:		
Education:		
Cost:		
Other:		

PLANNING AND IMPLEMENTING SUPERVISED ON-JOB EXPERIENCE PROGRAMS FOR AGRIBUSINESS

UNIT IV

ASSIGNMENT SHEET #2

SUPERVISED OCCUPATIONAL EXPERIENCE AGREEMENT

Starting date: ______________________________

Ending date: ______________________________

Hours: ______________________________

Wages: ______________________________

Experiences: ______________________________

____

____

____

____

____

____

____

____

____

____

PLANNING AND IMPLEMENTING SUPERVISED ON-JOB EXPERIENCE PROGRAMS FOR AGRIBUSINESS
UNIT IV

ASSIGNMENT SHEET #3 - SPECIFIC EXPERIENCES TO BE GAINED

Indicate the specific experiences to be gained that will assist in achieving your desired career goal.

Name of Business Agribusiness experience is obtained	Specific experience and/or skills developed	Indicate how each experience will assist you towards achieving your occupational goals

PLANNING AND IMPLEMENTING SUPERVISED ON-JOB EXPERIENCE PROGRAMS FOR AGRIBUSINESS

UNIT IV

ASSIGNMENT SHEET #4 -OTHER INFORMATION

____
(course name)

____
(date)

Name ____________________ Class ____________________ Age __________

Address ____________________ Post Office ____________________

Telephone Number ____________________ Date of Birth ____________________

Social Security Number __________ KS Driver's License # ____________________

Father's Name ____________________ Mother's Name ____________________

Direction to Home if applicable ____________________

Father's Occupation ____________________ Mother's Occupation ____________________

No. of Brothers ____________________ No. of Sisters ____________________

Agricultural experience (years) Agribusiness __________ Farm __________

Are you in 4-H __________ What FFA degrees do you have? ____________________

List your class schedule on the back of this page.

Agriculture Mechanics Work or Project	Ag. Sales and Services
Kind of Work	Kind of Work

What is your occupational objective and occupational objective code? 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0199 ____________________

What are your plans after graduating from high school? ____________________

____

Why did you enroll in this course? ____________________

____

List previous courses taken in Vocational Agriculture ____________________

____

Name____________________

CLASS SCHEDULE

PERIOD	1	2	3	4	5	6	7	8	9	10
TIME										
Monday										
Tuesday										
Wednesday										
Thursday										
Friday										

FARM CREDIT
UNIT V

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to calculate interest rates. The students should be able to list the types of farm credit and be able to recognize the importance of credit in relation to his or her farming program. The student should demonstrate the procedures for obtaining a loan. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion, the student should be able to:

1. Define five terms associated with farm credit.
2. Name five important characteristics a lender looks for in a borrower.
3. Name five main sources of farm credit.
4. Name five important characteristics a borrower looks for in a lender.
5. Name the three classes of credit.
6. Recognize and name five factors indicating that borrowing is a good business practice.
7. Recognize and list five causes for poor repayment ability on a loan.
8. Identify credit instruments and develop his or her ability to use these instruments in his or her farming programs.
9. Name five factors to take into consideration when writing a check.
10. Calculate interest when given a problem and a formula.
11. Demonstrate his or her ability to write a check.

FARM CREDIT
UNIT V

INFORMATION SHEET

I. Terms and definitions

   A. Credit - A desirable and useful farm tool when it will improve the economic and social well-being of the farm family

   B. Interest charge - The amount of money charged for the use of money loaned

   C. Check - A signed written order on a bank to pay a certain sum of money on demand to the bearer of the check or to the order of a named person

   D. Draft - An instrument similar to a check except that the order when paid by the bank is not charged to the signer but to a third person named on the face of the draft

   E. Promissory note - An unconditional written promise, signed by the maker, to pay on demand or at a fixed or determinable future time, a certain sum in money to the bearer of the designated payee on his order

   F. Mortgage - An instrument creating a lien on property or making a conditional transfer of title to property, and given as security for the payment of a debt or the carrying out of a contract

   G. Lien - A legal claim against property, usually proven by a mortgage, a security agreement, a sales contract, or other written contracts

   H. Warehouse receipt - A receipt given by a warehouseman for goods received by him for storage in his warehouse

   I. Bill of lading - A contract or receipt signed by a common carrier agreeing to deliver the described freight to a given person at a stated place

   J. Release - The transfer of a person's interest or right in property to another person or company who has an interest in and usually possession of said interest or property

   K. Sales contract - An agreement by one party to sell a property or a service to a second party for a stated price and under stated conditions

   L. Consumer credit - The services bought that are used up or consumed and do not directly improve the earning capacity or financial condition of the borrower

II. Characteristics lender seeks in borrower
   A. Personal characteristics
   B. Financial position
   C. Repayment capacity
   D. Purpose of loan
   E. Security for loan

III. Sources of farm credit
   A. Merchants and dealers - (short-term loan)
   B. Individual - (short-term and intermediate loans)
   C. Commercial banks - (short-term and intermediate loans)
   D. Insurance companies - (long-term loans)
   E. Federal Land Bank - (long-term loans)
   F. Production Credit Association - (short-term and intermediate loans)
   G. Farm Home Adminstration - (short-term and intermediate loans)

   (NOTE: Type of loan listed is of primary interest to lending source.)

IV. Characteristics borrower seeks in lender
   A. Character
   B. Lending policies
   C. Permanence and dependability
   D. Experience and knowledge of farming
   E. Cost of the loan

V. Classes of credit
   A. Financing crop and livestock
   B. Financing land
   C. Financing farmers' cooperatives

VI. Factors indicating that borrowing is good business practice
   A. An additional income
   B. An increase in size of operation
   C. A product price rise
   D. A sufficient repayment capacity
   E. An individual's ability as a manager

VII. Causes of poor repayment
  A. Business too small
  B. Low production per unit due to
    1. Poor crop yield
    2. Small calf crop
    3. Small pig crop
    4. Small returns from poultry
  C. Low price per unit sold due to
    1. Poor market
    2. Poor marketing
    3. Poor quality
  D. High cash production costs due to
    1. High feed
    2. High labor
    3. High replacement
  E. High cash overhead due to
    1. Heavy debt load
    2. High interest rate
    3. Heavy taxes
    4. High maintenance costs
  F. High cash living costs due to
    1. Extravagance
    2. Sickness
    3. Education of children
  G. Borrowing above ability to repay
  H. Overestimating the amount of the loan

VIII. Credit instruments (See Supplemental Information Sheets)
  A. Check
  B. Draft
  C. Promissory note
  D. Warehouse receipt
  E. Samples

IX. Factors to consider when writing a check (Transparency 1)

  A. Written in ink

  B. Written plainly

  C. Written to prevent space between dollar sign and check amount

  D. Amount spelled out in writing

  E. Never made payable to cash

  F. Blank check never signed

  G. Check voided if mistake is made

  H. What check was given for

  I. Information about check recorded in register (number, date, description of transaction, payment, balance)

X. Calculating interest rates

  A.

$$\frac{\text{Total of Finance Charges}}{\text{1/2 Original Loan}} \times \frac{\text{No. of Payments}}{\text{No. of Years}} \times \frac{1}{\text{No. of Payments Plus 1}} = \text{True Annual Rate of Interest}$$

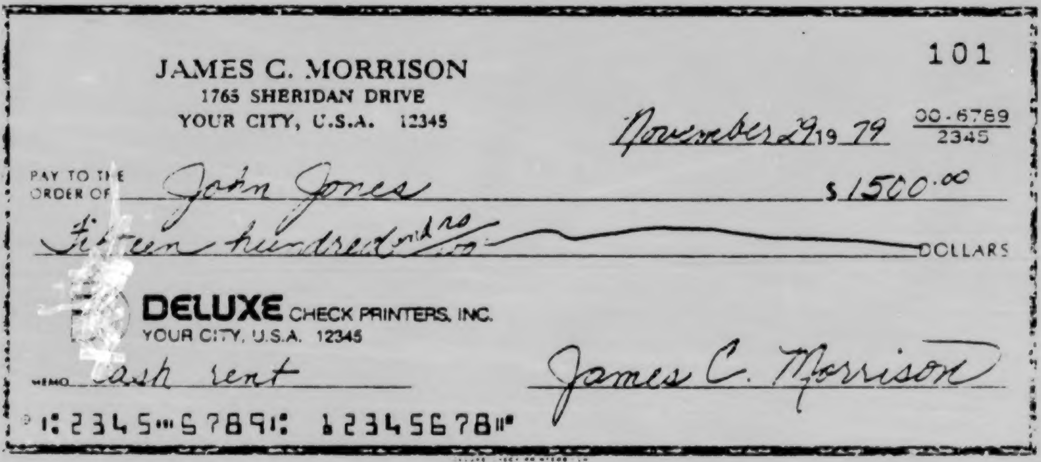
  B. Example:

  A farmer borrowed \$8,000 which cost him \$400 for 24 months. What was his interest rate?

$$\frac{400}{4{,}000} \times \frac{24}{2} \times \frac{1}{25} = 4.8\% \text{ interest}$$

CREDIT INSTRUMENTS

SAMPLE CHECK



101

JAMES C. MORRISON
1765 SHERIDAN DRIVE
YOUR CITY, U.S.A. 12345

November 29 19 79

00-6789
2345

PAY TO THE ORDER OF John Jones $1500.00

Fifteen hundred and no/100 DOLLARS

DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO cash rent

James C. Morrison

⑆2345⑈6789⑆ 12345678⑈

FARMERS CO-OP. ASSN. - MANHATTAN, KANSAS № 09333

LOAD OF Wheat DATE May 28, 1980

TO John Doe

GROSS	19	600	LBS.
TARE	13	350	LBS.
NET			LBS.

TEST 60lb MOIST. 10.5% GRADE O. K.

PRICE 3^{62} PER BU. PER CWT. AMT. $

DRIVER Tom Smith ON ☐ OFF ☑

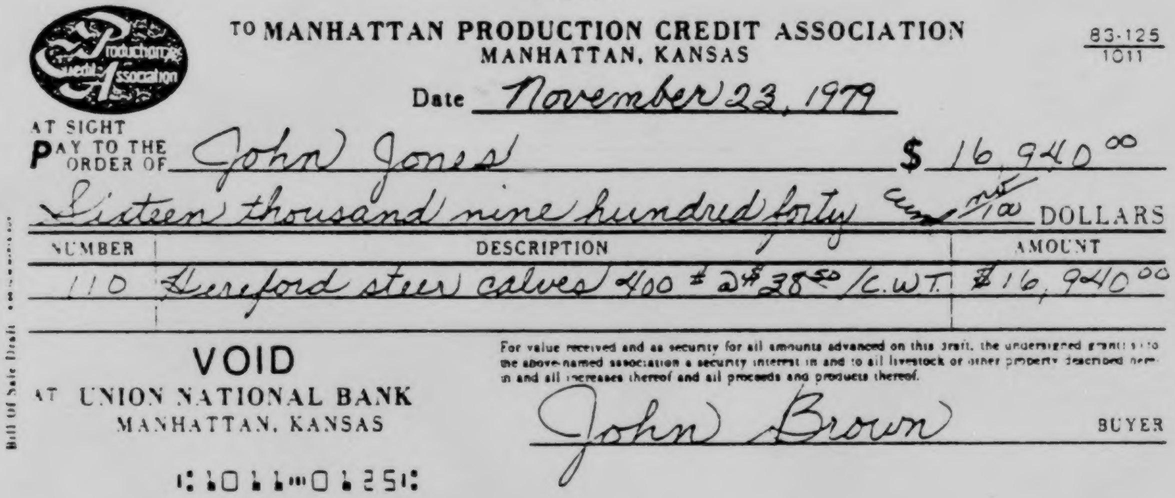
BUSHELS 104.16 WEIGHER JHS

APPROVED BY K. S. G. I. D.

CREDIT INSTRUMENTS

A BILL OF SALE SIGHT DRAFT

Front



TO **MANHATTAN PRODUCTION CREDIT ASSOCIATION**
MANHATTAN, KANSAS

83-125
1011

Date November 23, 1979

AT SIGHT
PAY TO THE ORDER OF John Jones $ 16,940.00

Sixteen thousand nine hundred forty and no/100 DOLLARS

NUMBER	DESCRIPTION	AMOUNT
110	Hereford steer calves 400 # @ $38.50 /C.W.T.	$16,940.00

VOID

AT UNION NATIONAL BANK
MANHATTAN, KANSAS

⑆1011⑈0125⑆

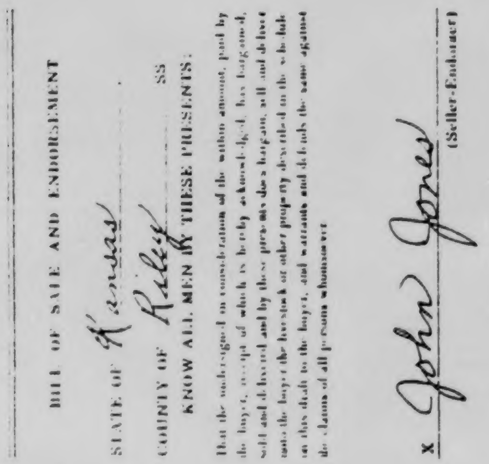
For value received and as security for all amounts advanced on this draft, the undersigned grants to the above-named association a security interest in and to all livestock or other property described herein and all increases thereof and all proceeds and products thereof.

John Brown BUYER

Bill Of Sale Draft

A BILL OF SALE SIGHT DRAFT

Back



BILL OF SALE AND ENDORSEMENT

STATE OF Kansas

COUNTY OF Riley SS

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned in consideration of the within amount, paid by the buyer, receipt of which is hereby acknowledged, has bargained, sold and delivered and by these presents does bargain, sell and deliver unto the buyer the livestock or other property described in the schedule on this draft to the buyer, and warrants and defends the same against the claims of all persons whomsoever.

x John Jones (Seller-Endorser)

SUPPLEMENTAL INFORMATION SHEET

Ag. II - 125-C

PROMISSORY NOTE, DISCLOSURE STATEMENT, & SECURITY AGREEMENT

NOTE NO	DATE OF NOTE	AMOUNT FINANCED
VOID	6-2-80	$ 4500.00

CONSUMER(S) NAME & ADDRESS (Last Name First)

ames C. Morrison
ancy C. Morrison
Anywhere Street
Anywhere, U.S.A.

LENDER/SECURED PARTY

COLLATERAL & SECURITY AGREEMENT

UNSECURED.

Collateral will be located in .... County at ☐ Consumers' Address
☐ Other Address ....

Collateral is to be used primarily for
☐ Personal, family, or household purposes
☐ Agricultural ☐ Business

Collateral is:
☐ Being acquired with loan proceeds
☐ Now owned by Consumers

This loan is secured by deposits of Consumers and all other parties liable hereon. The undersigned also grant to Lender a security interest under the Uniform Commercial Code in the above property, together with all parts and equipment used in connection therewith, additions, replacements, accessions, proceeds, products, and similar after acquired property, provided, this security interest shall not attach to after-acquired consumer goods (except accessions) unless the undersigned acquire rights in such after-acquired consumer goods within ten days after the Lender gives value. The undersigned grant to Lender a security interest by an assignment by agreement in any returned or unearned insurance premiums. This security interest is given to secure payment of all the Consumers' present and future indebtedness of any type to Lender, including without limitation, future advances, overdrafts, all expenditures by Lender for taxes, insurance, repairs to and maintenance of collateral, and all expenses of the Lender in realizing on its security interest.

If the collateral includes livestock, Consumers grant to Lender a security interest in all increases thereof, including all conceived but unborn young, feed and equipment used in handling livestock, and all the Consumers' right, title, and interest in all contracts and leases for all lands used for pasture and grazing purposes.

If the collateral consists of crops, the security interest herein granted shall include all crops and products thereof which are growing or planted within one year after the date of this agreement. A security interest in crops which is given in conjunction with a lease of land, purchase of land, or improvements thereto, shall include all crops to be grown on the land concerned during the period of such real estate transaction.

We agree to the terms of this Security Agreement, **including the provisions printed on the reverse side.**

James C. Morrison James C. Morrison
x Nancy Morrison Nancy C. Morrison

PROMISSORY NOTE

For value received, Consumers promise to pay to the order of the Lender named herein the Amount Financed, together with a **FINANCE CHARGE**, all as set forth below. Each payment shall be applied first to interest as of the date payment is received, with the remainder of such payment being applied to reduce the principal.

The disclosures herein are based upon the the payment schedule assumed below, and variance from this schedule may cause certain amounts to be less or greater than stated.

PREPAYMENT: Consumers may prepay this loan in full at any time without penalty.

MINIMUM FINANCE CHARGE. The Lender will collect or retain a minimum **FINANCE CHARGE** of $5.00 when the Amount Financed is $75.00 or less, or $7.50 when the Amount Financed exceeds $75.00.

ACCELERATION OF PAYMENT: Lender may accelerate payment or performance of this note if: (a) any sum is not paid when due; or (b) the Lender or holder believes that the prospect of payment, performance, or realization of collateral is significantly impaired, or (c) upon the commencement of any proceedings under any bankruptcy or insolvency laws by or against any party liable hereon directly or contingently.

Lender may apply any monies belonging to Consumers or any other party liable hereon, which are on deposit with Lender in satisfaction of all amounts due to any holder of this note.

Consumers and all other signers waive presentment, notice of dishonor and protest, and consent to: (a) any and all extensions of time for any term or terms regarding any payment due under this note, partial payments or renewals before or after maturity, (b) any substitution or release of collateral, and (c) the addition or release of any party or guarantor. Acceptance of partial payment or performance shall not operate as a waiver of any requirement of this note.

PURPOSE OF LOAN IF IN EXCESS OF $5,000

PURCHASE CALFS

DATE FINANCE CHARGE BEGINS TO ACCRUE	NUMBER OF PAYMENTS	FREQUENCY OF PAYMENTS	AMOUNT OF PAYMENTS		DUE DATES OF PAYMENTS		
			Regular	Final	First Payment	Other Payments Same Day of Each Month	Final Payment
6-2-80	1	xx 180 days. ☐ Monthly	$	$ 4,843.97			11-29-80

DISBURSEMENT STATEMENT

	1	Total Balances Refinanced
		NEW DISBURSEMENTS TO:
4500.00	2	
	3	
	4	
4500.00	5	TOTAL PROCEEDS OF LOAN (Add 1 thru 4)
		Additional Charges — Not included in **FINANCE CHARGE**
	6	Credit Life Insurance
	7	Disability Insurance
	8	Property Insurance
	9	Vendor's Single Interest Insurance
	10	Filing and Releasing
	11	License, Title, & Registration
	12	
	13	Total Additional Charges (Add 6 thru 12)
4500.00	14	Amount Financed (Add 5 and 13)
343.97	15	**FINANCE CHARGE** (If paid on schedule)
4,843.97	16	Total of Payments (If paid on schedule) (Add 14 and 15)
.50 %	17	**ANNUAL PERCENTAGE RATE**

NOTICE TO CONSUMERS

1. **Do not sign this agreement before you read it.**
2. **You are entitled to a copy of this agreement.**
3. **You may prepay the unpaid balance at any time without penalty.**

LENDER SIGNATURE .... representing the Lender

INSURANCE STATEMENT

CREDIT LIFE & DISABILITY INSURANCE are not required to obtain this loan. Such insurance will only be provided if Consumers request Lender to obtain such insurance by checking the type of coverage desired and signing below.

☐ Credit Life Insurance for the term of loan, or until ....
Cost for One Person $ .... Cost for Two Persons $ ....
☐ Disability Insurance for the term of loan, or until ....
Cost for One Person $ ....
xxx I/We do not want Credit Life or Disability Insurance.

PROPERTY & VENDOR'S SINGLE INTEREST INSURANCE may be obtained by Consumers through any person of their choice. If obtained through Lender, the costs will be:
☐ Property Insurance for .... months at a cost of $ ....
☐ Vendor's Single Interest Insurance for .... months: $ ....
(The insurer issuing this policy waives its right to subrogation against Consumers.)
☐ .... $ ....

I/We desire the insurance checked above. **Date**

x James C. Morrison James C. Morrison
x Nancy Morrison Nancy C. Morrison

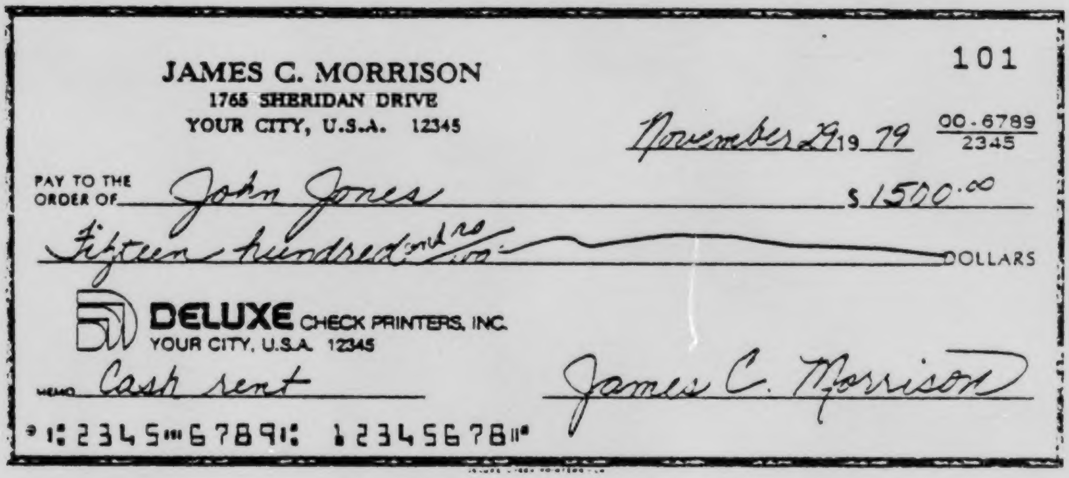
CONSUMER SIGNATURES

This loan is subject to Sections 1 thru 131 of the Kansas Uniform Consumer Credit Code.
xxx I/We agree to the terms of this Promissory Note & Disclosure Statement, and terms of Security Agreement, **including the terms on the reverse side.**
☐ ....
I/We have received a completed copy of this form.

x James C. Morrison James C. Morrison

CHECK WRITING

SAMPLE CHECK



101

JAMES C. MORRISON
1765 SHERIDAN DRIVE
YOUR CITY, U.S.A. 12345

November 29 19 79

00-6789
2345

PAY TO THE ORDER OF John Jones $ 1500.00

Fifteen hundred and no/100 DOLLARS

DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO Cash rent

James C. Morrison

⑆2345⑈6789⑆ 12345678⑈

SAMPLE CHECK REGISTER

RECORD ALL CHARGES OR CREDITS THAT AFFECT YOUR ACCOUNT

NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)		√ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)		BALANCE	
									$ 3400	00
101	11/29	John Johns Cash rent	$ 1500	00		$	$		1500 1900	00 00

FARM CREDIT
UNIT V

ASSIGNMENT SHEET #1 - WRITING CHECKS

Write two checks using the information below.

Check #1:

a. Date: Determined when check is written

b. Pay to: John Doe

c. Amount: $250.00

d. For: Pasture lease

e. Sign your name

f. Record check in register

(NOTE: When finished writing the check, write void across the face of the check.)

101

00-6789
2345

______________ 19____

PAY TO THE
ORDER OF ________________________________ $__________

____ DOLLARS

DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO ____________________ ____________________

⑆2345⑈6789⑆ 12345678⑈

RECORD ALL CHARGES OR CREDITS THAT AFFECT YOUR ACCOUNT

NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)	✓ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)	BALANCE
							$
			$		$	$	

Check #2:

a. Date: Determined when check is written

b. Pay to: Henry Doe

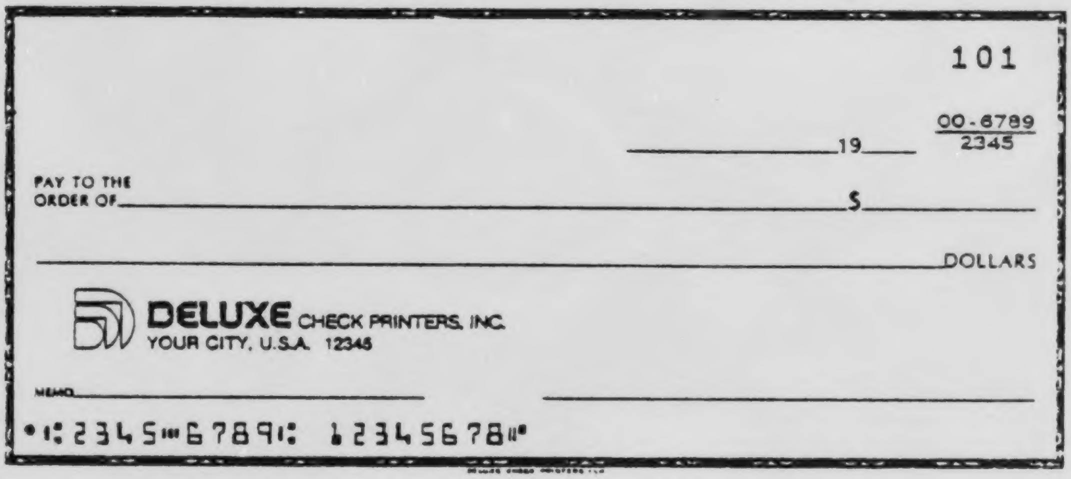
c. Amount: $345.50

d. For: Two cows

e. Sign your name

f. Record check in register

(NOTE: When finished writing the check, write void across the face of the check.)



101

_______________19____ 00-6789/2345

PAY TO THE ORDER OF_______________________________$__________

____DOLLARS

DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO____________________ ____________________

•⑆2345⑈6789⑆ 12345678⑈

RECORD ALL CHARGES OR CREDITS THAT AFFECT YOUR ACCOUNT

NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)		√ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)		BALANCE	
			$			$	$		$	

FARM CREDIT
UNIT V

ASSIGNMENT SHEET #2 - CALCULATING TRUE INTEREST RATE

Work each of the problems listed below using the formula given by the instructor. When work is finished turn in to the instructor for grading.

1. Farmer "A" borrows $1,200.00 which cost him $200.00 for 24 months. What was his true interest rate?

2. Farmer "B" borrows $800.00 which cost him $40.00 for 12 months. What rate of interest did he pay?

3. Farmer "C" borrows $24,000.00 which cost him $1,000.00 for 24 months. What was his rate of interest?

FARM CREDIT
UNIT V

ASSIGNMENT SHEET #3 - CALCULATING DIFFERENCES OF 1% IN INTEREST RATES

The purpose of this assignment sheet is to show the differences of 1% in interest rates, in dollars and cents. Work each of these problems and turn your work in to the instructor for grading.

1. Farmer "A" borrows $100,000.00 from his bank to purchase some additional farm land. The interest was 10% which made his monthly payment $877.58 for 30 years. How much had Farmer "A" paid the bank at the end of the 30 years?

2. Farmer "B" borrows $100,000.00 from his bank to also purchase some additional farm land. Farmer"B" had to pay 11% interest which made his monthly payment $952.34 for 30 years. How much had Farmer "B" paid the bank at the end of the 30 years?

3. The difference between Farmer "A"s 10% loan and Farmer "B"s 11% loan was how much over the course of 30 years?

FARM CREDIT
UNIT V

ANSWERS TO ASSIGNMENT SHEET #3

1. 30 yrs X 12 months = 360 months
   360 months X $877.58 = $315,928.80

2. 30 yrs X 12 months = 360 months
   360 months X $952.34 = $342,842.40

3. $342,842.40 - $315,928.80 = $26,913.60

FARM CREDIT
UNIT V

TEST

1. Define the following terms -
    a. Lien -
    b. Consumer credit -
    c. Check -
    d. Warehouse receipt -
    e. Credit

2. What are five important characteristics a lender looks for in a borrower?
    a.
    b.
    c.
    d.
    e.

3. List five main sources of farm credit.
    a.
    b.
    c.
    d.
    e.

4. Name five important characteristics a borrower looks for in a lender.
    a.
    b.
    c.
    d.
    e.

5. What are three classes of credit?

   a.

   b.

   c.

6. Name five factors indicating that borrowing is a good business practice.

   a.

   b.

   c.

   d.

   e.

7. Name five causes for poor repayment ability on a loan.

   a.

   b.

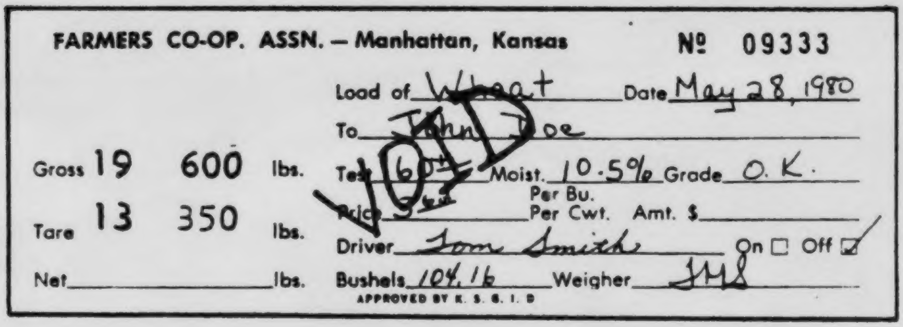
   c.

   d.

   e.

8. Identify the following credit instruments.

   a. ____________________



FARMERS CO-OP. ASSN. — Manhattan, Kansas № 09333

Load of Wheat Date May 28, 1980

To John Doe

Gross 19 600 lbs.

Tare 13 350 lbs.

Net ______ lbs.

Test 60# Moist. 10.5% Grade O.K.

Price 3 Per Bu. Per Cwt. Amt. $______

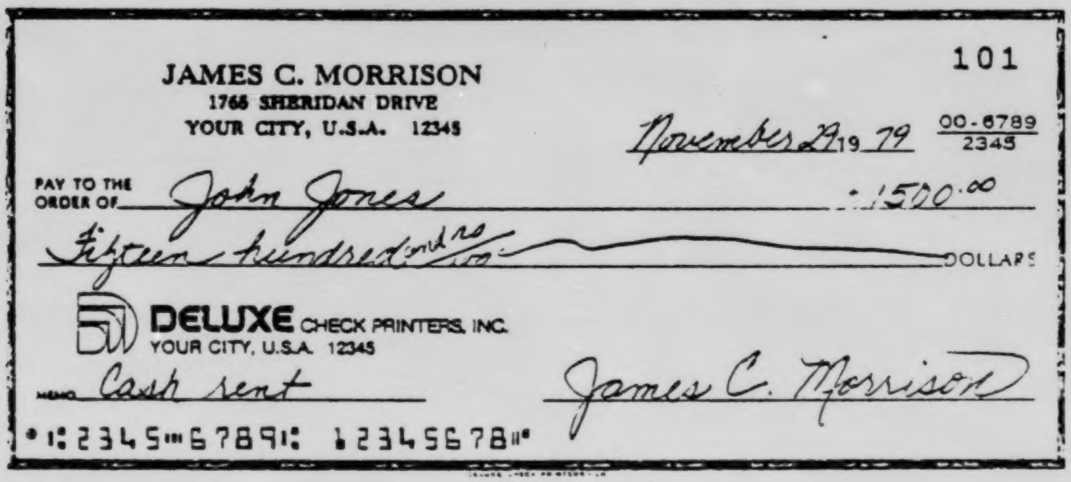
Driver Tom Smith On ☐ Off ☑

Bushels 104.16 Weigher JMS

APPROVED BY K. S. G. I. D

VOID

b. ____________________



JAMES C. MORRISON
1766 SHERIDAN DRIVE
YOUR CITY, U.S.A. 12345

101

November 29 19 79

00-6789
2345

PAY TO THE ORDER OF John Jones $ 1500.00

Fifteen hundred and no/100 DOLLARS

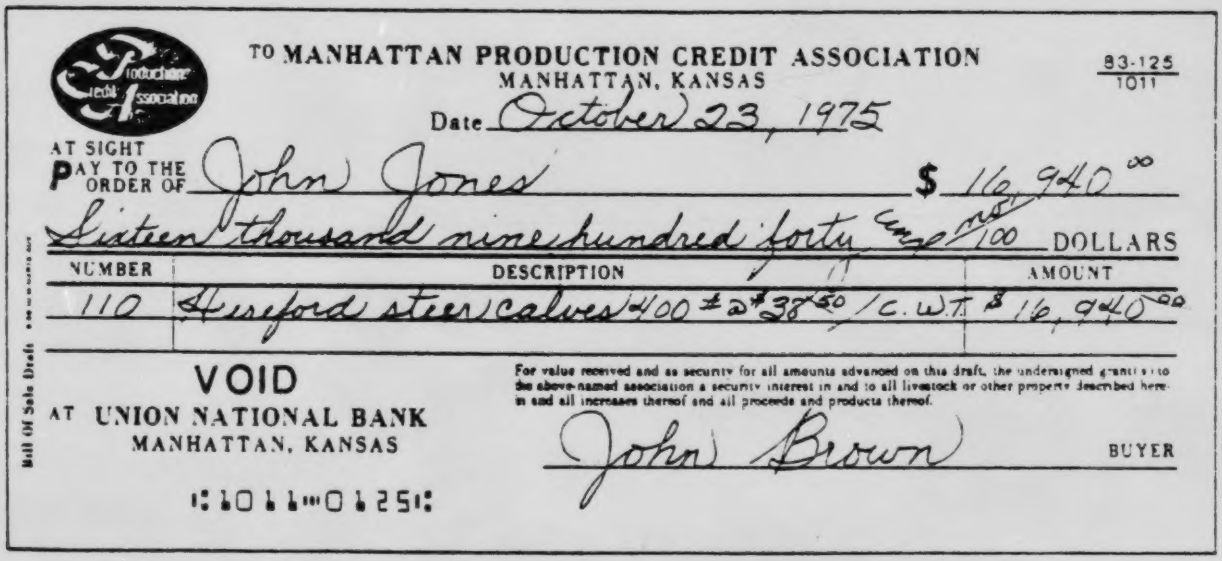
DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO Cash rent

James C. Morrison

⑆2345⑉6789⑆ 12345678⑈

c. ____________________



TO **MANHATTAN PRODUCTION CREDIT ASSOCIATION**
MANHATTAN, KANSAS

83-125
1011

Date October 23, 1975

AT SIGHT PAY TO THE ORDER OF John Jones $ 16,940.00

Sixteen thousand nine hundred forty and no/100 DOLLARS

NUMBER	DESCRIPTION	AMOUNT
110	Hereford steer calves 400# @ $38.50/C.W.T.	$16,940.00

VOID

AT UNION NATIONAL BANK
MANHATTAN, KANSAS

⑆1011⑉0125⑆

For value received and as security for all amounts advanced on this draft, the undersigned grants to the above-named association a security interest in and to all livestock or other property described herein and all increases thereof and all proceeds and products thereof.

John Brown BUYER

Bill Of Sale Draft

Ag. II - 142-C
d. ______________________

NOTE NO	DATE OF NOTE	AMOUNT FINANCED
VOID	6-2-80	$ 4500.00

CONSUMERS' NAME & ADDRESS (Last Name First)

James C. Morrison
Nancy C. Morrison
Anywhere Street
Anywhere, U.S.A.

LENDER/SECURED PARTY

For value received, Consumers promise to pay to the orde[illegible] the Lender named herein the Amount Financed, together with a **FINANCE CHARGE**, all as set forth below. Each payment shall be applied first to interest as of the date payment is received, with the remainder of such payment being applied to reduce the principal.

The disclosures herein are based upon the the payment schedule assumed below, and variance from this schedule may cause certain amounts to be less or greater than stated.

PREPAYMENT: Consumers may prepay this loan in full at any time without penalty.

MINIMUM FINANCE CHARGE: The Lender will collect or retain a minimum **FINANCE CHARGE** of $5.00 when the Amount Financed is $75.00 or less, or $7.50 when the Amount Financed exceeds $75.00.

ACCELERATION OF PAYMENT: Lender may accelerate payment or performance of this note if: (a) any sum is not paid when due; or (b) the Lender or holder believes that the prospect of payment, performance, or realization of collateral is significantly impaired; or (c) upon the commencement of any proceedings under any bankruptcy or insolvency laws by or against any party liable hereon directly or contingently.

Lender may apply any monies belonging to Consumers or any other party liable hereon, which are on deposit with Lender in satisfaction of all amounts due to any holder of this note.

Consumers and all other signers waive presentment, notice of dishonor and protest, and consent to: (a) any and all extensions of time for any term or terms regarding any payment due under this note, partial payments or renewals before or after maturity, (b) any substitution or release of collateral, and (c) the addition or release of any party or guarantor. Acceptance of partial payment or performance shall not operate as a waiver of any requirement of this note.

COLLATERAL & SECURITY AGREEMENT

UNSECURED.

Collateral will be located in .... County at ☐ Consumers' Address
☐ Other Address ....

Collateral is to be used primarily for:
☐ Personal, Family, or Household purposes
☐ Agricultural ☐ Business

Collateral is:
☐ Being acquired with loan proceeds
☐ Now owned by Consumers

This loan is secured by deposits of Consumers and all other parties liable hereon. The undersigned also grant to Lender a security interest under the Uniform Commercial Code in the above property, together with all parts and equipment used in connection therewith, additions, replacements, accessions, proceeds, products, and similar after-acquired property; provided, this security interest shall not attach to after-acquired consumer goods, except accessions, unless the undersigned acquire rights in such after-accuired consumer goods within ten days after the Lender gives value. The undersigned grant to Lender a security interest by an assignment by agreement in any returned or unearned insurance premiums. This security interest is given to secure payment of all the Consumers' present and future indebtedness of any type to Lender, including without limitation, future advances, overdrafts, all expenditures by Lender for taxes, insurance, repairs to and maintenance of collateral, and all expenses of the Lender in realizing on its security interest.

If the collateral includes livestock, Consumers grant to Lender a security interest in all increases thereof, including all conceived but unborn young, feed and equipment used in handling livestock, and all the Consumers' right, title, and interest in all contracts and leases for all lands used for pasture and grazing purposes.

If the Collateral consists of crops, the security interest herein granted shall include all crops and products thereof which are growing or planted within one year after the date of this agreement. A security interest in crops which is given in conjunction with a lease of land, purchase of land, or improvements thereto, shall include all crops to be grown on the land concerned during the period of such real estate transaction.

I/We agree to the terms of this Security Agreement, **including the provisions printed on the reverse side.**

x James C. Morrison James C. Morrison
x Nancy Morrison Nancy C. Morrison

PURPOSE OF LOAN IF IN EXCESS OF $5,000:

PURCHASE CALFS

DATE FINANCE CHARGE BEGINS TO ACCRUE	NUMBER OF PAYMENTS	FREQUENCY OF PAYMENTS	AMOUNT OF PAYMENTS Regular	AMOUNT OF PAYMENTS Final	DUE DATES OF PAYMENTS First Payment	Other Payments Same Day of Each Month	Final Payment
6-2-80	1	☒ 180 days. ☐ Monthly	$	$ 4,843.97			11-29-80

DISBURSEMENT STATEMENT

	1	Total Balances Refinanced
		NEW DISBURSEMENTS TO:
4500.00	2	
	3	
	4	
4500.00	5	TOTAL PROCEEDS OF LOAN (Add 1 thru 4)
		Additional Charges — Not included in **FINANCE CHARGE**
	6	Credit Life Insurance
	7	Disability Insurance
	8	Property Insurance
	9	Vendor's Single Interest Insurance
	10	Filing and Releasing
	11	License, Title, & Registration
	12	
	13	Total Additional Charges (Add 6 thru 12)
4500.00	14	Amount Financed (Add 5 and 13)
343.97	15	FINANCE CHARGE (If paid on schedule)
4,843.97	16	Total of Payments (If paid on schedule) (Add 14 and 15)
15.50 %	17	ANNUAL PERCENTAGE RATE

INSURANCE STATEMENT

CREDIT LIFE & DISABILITY INSURANCE are not required to obtain this loan. Such insurance will only be provided if Consumers request Lender to obtain such insurance by checking the type of coverage desired and signing below.

☐ Credit Life Insurance for the term of loan, or until ______________
Cost for One Person $ ____________ Cost for Two Persons $ ____________
☐ Disability Insurance for the term of loan, or until ______________
Cost for One Person $ ____________
☒ I/We do not want Credit Life or Disability Insurance.

PROPERTY & VENDOR'S SINGLE INTEREST INSURANCE may be obtained by Consumers through any person of their choice. If obtained through Lender, the costs will be:
☐ Property Insurance for ____________ months at a cost of $____________
☐ Vendor's Single Interest Insurance for ____________ months: $____________
(The insurer issuing this policy waives its right to subrogation against Consumers.
☐ ______________________________ $____________

I/We desire the insurance checked above. **Date**

x James C. Morrison James C. Morrison
x Nancy Morrison Nancy C. Morrison

NOTICE TO CONSUMERS

1. **Do not sign this agreement before you read it.**
2. **You are entitled to a copy of this agreement.**
3. **You may prepay the unpaid balance at any time without penalty.**

LENDER SIGNATURE ____________________ representing the Lender

CONSUMER SIGNATURES

This loan is subject to Sections 1 thru 131 of the Kansas Uniform Consumer Credit C[illegible]
I/We agree to the terms of this Promissory Note & Disclosure Statement, and terms [illegible]
☒ Security Agreement, **including the terms on the reverse side.**
☐ ______________________________

I/We have received a completed copy of this form.

x James C. Morrison James C. Morrison

9. Name five factors to consider when writing a check.
   - a.
   - b.
   - c.
   - d.
   - e.

10. If a farmer borrows $10,000.00 which cost him $500 for 24 months, what is the percent of interest rate?

11. Write a check to Sam White for $842.50 for purchase of cattle. Record information about check in the register.

101

00-6789
2345

_______________ 19 ___

PAY TO THE
ORDER OF____ $__________

____ DOLLARS

DELUXE CHECK PRINTERS, INC.
YOUR CITY, U.S.A. 12345

MEMO_______________________ _______________________

⑆2345⑈6789⑆ 12345678⑈

RECORD ALL CHARGES OR CREDITS THAT AFFECT YOUR ACCOUNT

NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)	√ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)	BALANCE
			$		$	$	$

ELEMENTARY STUDY OF SOILS
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize the importance of soils to his or her daily life. The student should be able to recognize how soils are formed and be able to distinguish between physical and chemical weathering. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion, the student should be able to:

1. Define five terms associated with soils.
2. List three reasons why soils are important.
3. Name five factors that are responsible for soil formation.
4. Distinguish between chemical and physical weathering.
5. Name five benefits of organic matter.
6. Name three soil particles.
7. Label a drawing showing the different layers of a soil profile.
8. Identify the seven kinds of soil structures.
9. Match the colors of soils with their identifying characteristics.
10. Label a drawing showing the composition of average soil.
11. Associate terms indicating degrees of slope, erosion, permeability, and soil depth when given the terms along with the degrees of each.
12. Read a soil survey map and determine the type of soil found within your community.

ELEMENTARY STUDY OF SOILS
UNIT I

INFORMATION SHEET

I. Terms and definitions

   A. Soil - The mineral and organic material that supports plant growth on the earth's surface.

   B. Soil Profile - The cross section of a soil from the top to the bottom.

   C. Soil Texture - The size of the individual soil particles such as sand, silt, and clay.

   D. Soil Color - An indication of the amount of organic matter, moisture, and texture of the soil.

   E. Soil Structure - The way the individual soil particles are grouped together to form clusters of particles.

   F. Rock Weathering - The process by which rocks are broken down into soil-sized particles through exposure to the weather over hundreds of years.

   G. Leaching - The removal of soil components from the soil by the downward action of water.

   H. Rock - A more or less consolidated mass composed of two or more minerals.

   I. Aggregate - A single mass or cluster of soil particles such as a clod, crumb, or granule.

   J. Slope - The number of feet fall in each 100 feet.

   K. Permeability - The movement of air and water through the soil.

   L. Depth - The total thickness of soil from the topsoil to the parent material.

   M. Soil Organisms - Plant and animal life that lives within the soil.

II. Importance of soils

   A. Provide food

   B. Provide energy

   C. Provide shelter

III. Factors affecting soil formation

A. Parent materials

1. Rocks

a. Igneous - Derived from the molten material in the center of the earth's crust

b. Metamorphic - Formed from the pre-existing rocks through the action of great heat and great pressures

c. Sedimentary - Deposited by river, moving glaciers, or wind

2. Moved by

a. Wind

b. Water

c. Glaciers

B. Weathering

1. Physical

2. Chemical

C. Climate

1. Temperature

2. Rainfall

D. Vegetation and organisms

1. Plant - Lichens, mosses, weeds, grasses, shrubs, trees

2. Animal - Bacteria, fungi, birds, men, earthworms, burrowing animals, actinomycetes

E. Slope and drainage

1. Hillsides

a. Thin topsoil - caused by erosion

b. Less plant growth

c. Less organic matter

d. Less Leaching

2. Flat lands

a. Deeper topsoil

b. More vegetation

c. More organic matter

d. More leaching

IV. Types of weathering (Transparency 1)

- A. Physical - Mechanical forces caused by temperature changes, such as heating and cooling, freezing, and thawing, which have soil abrasive action)
- B. Chemical - Chemical reactions of water, oxygen, and carbon dioxide

V. Benefits of organic matter

- A. Makes soil porous
- B. Supplies nitrogen to the plant
- C. Holds water in the soil
- D. Furnishes food for soil organisms
- E. Stores mineral nutrients
- F. Reduced leaching
- G. Stabilizes soil structure

VI. Soil particles (Transparency 2)

- A. Sand
- B. Silt
- C. Clay

VII. Soil profile (Transparencies 3 and 4)

- A. Topsoil
  - 1. A1 - Horizon
  - 2. A2 - Horizon
- B. Subsoil
  - 1. B - Subsoil
- C. Parent material
  - 1. C - Parent material

VIII. Kinds of soil structure (Transparency 5)

- A. Crumb
- B. Granular
- C. Platy
- D. Angular Blocky
- E. Subangular Blocky
- F. Prismatic
- G. Columnar

IX. Soil color

  A. Dark brown to black - Regarded as being the most productive

  B. Red or reddish brown - Usually less fertile than black or dark brown soils

  C. Yellow - Usually caused by imperfect drainage

  D. Gray - Low in organic matter

X. Soil composition (Transparency 6)

  A. Mineral matter - 45%

  B. Water - 25%

  C. Air - 25%

  D. Organic matter - 5%

XI. Soil descriptions

  A. Degrees of erosion

    1. None to slight - Less than 25 percent surface soil removed with no gullies

    2. Moderate - 25 to 75 percent of surface soil removed with or without gullies

    3. Severe - 75 percent or more of the surface soil removed with occasional uncrossable gullies and/or severe accumulation by wind

    4. Very severe - 75 percent or more of surface soil removed with frequent uncrossable gullies and/or severe accumulation by wind

  B. Soil depths

    1. Deep - More than thirty-six inches deep

    2. Moderately deep - Twenty to thirty-six inches deep

    3. Shallow - Ten to twenty inches deep

    4. Very shallow - Less than ten inches deep

  C. Degrees of permeability

    1. Very slow - Soils that have dense, heavy clay or clay pay subsoils

    2. Slow - Soils that have crumbly, clayey subsoils

    3. Moderate - Soils that have highly granular, clay loam subsoils

    4. Rapid - Soils that have sandy subsoils

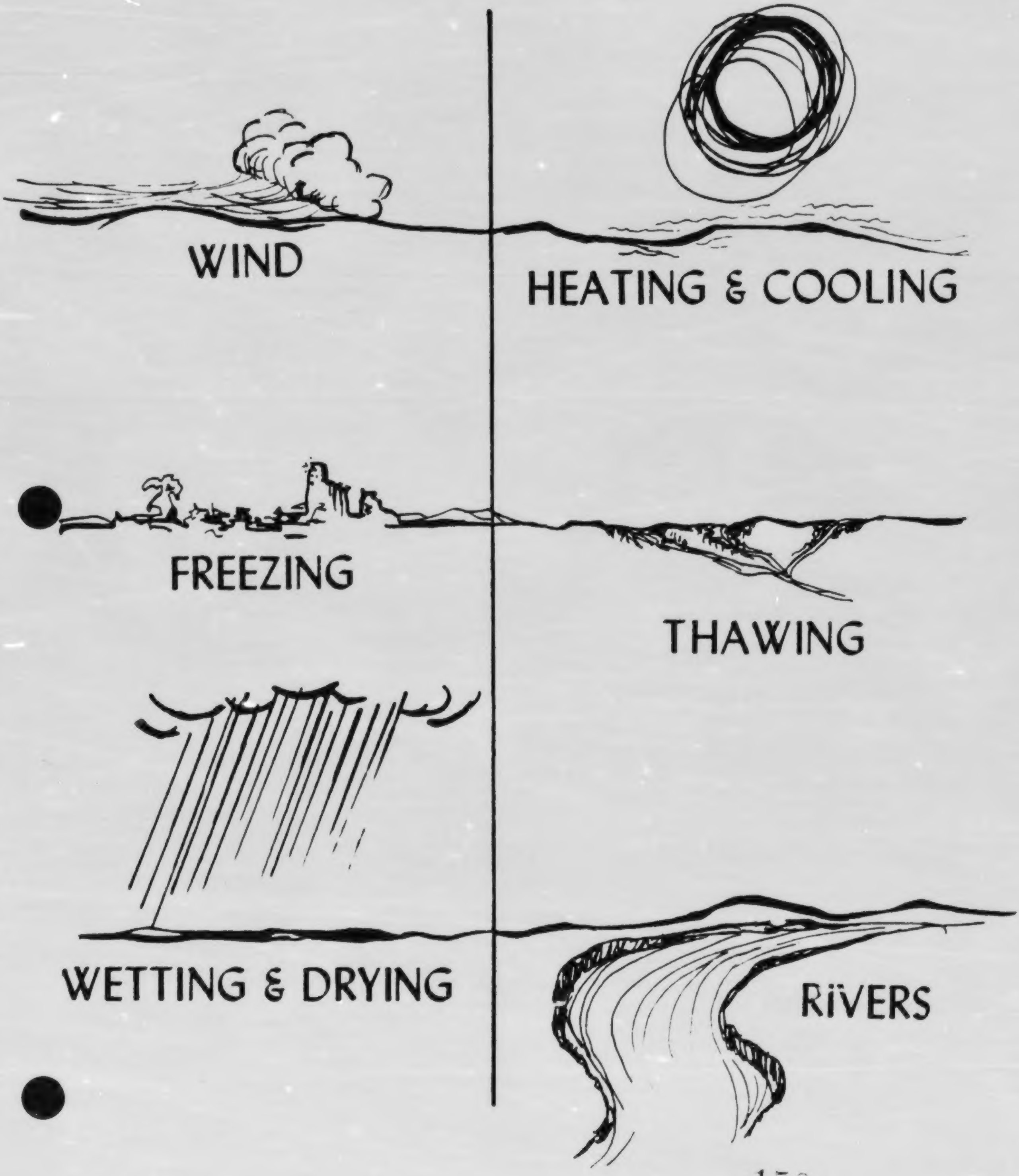
  D. Degrees of slope

    1. Nearly level - Less than one foot fall in each 100 feet

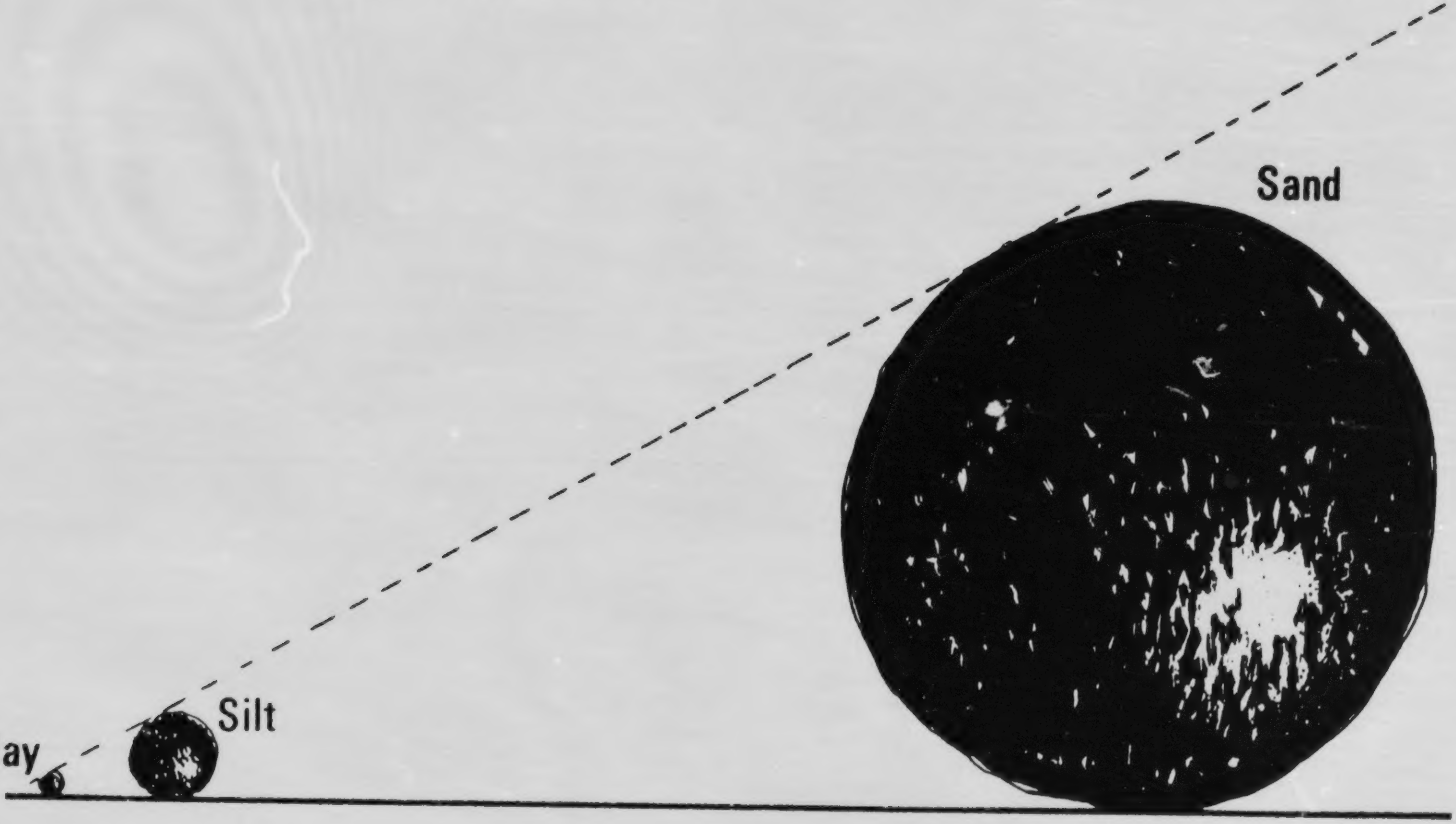
    2. Gently sloping - One to three feet fall in each 100 feet

3. Moderately sloping - Three to five feet fall in each 100 feet
4. Strongly sloping - Five to eight feet fall in each 100 feet
5. Steep - Eight to twelve feet fall in each 100 feet
6. Very steep - More than twelve feet fall in each 100 feet

TYPES OF PHYSICAL WEATHERING


WIND
HEATING & COOLING
FREEZING
THAWING
WETTING & DRYING
RIVERS

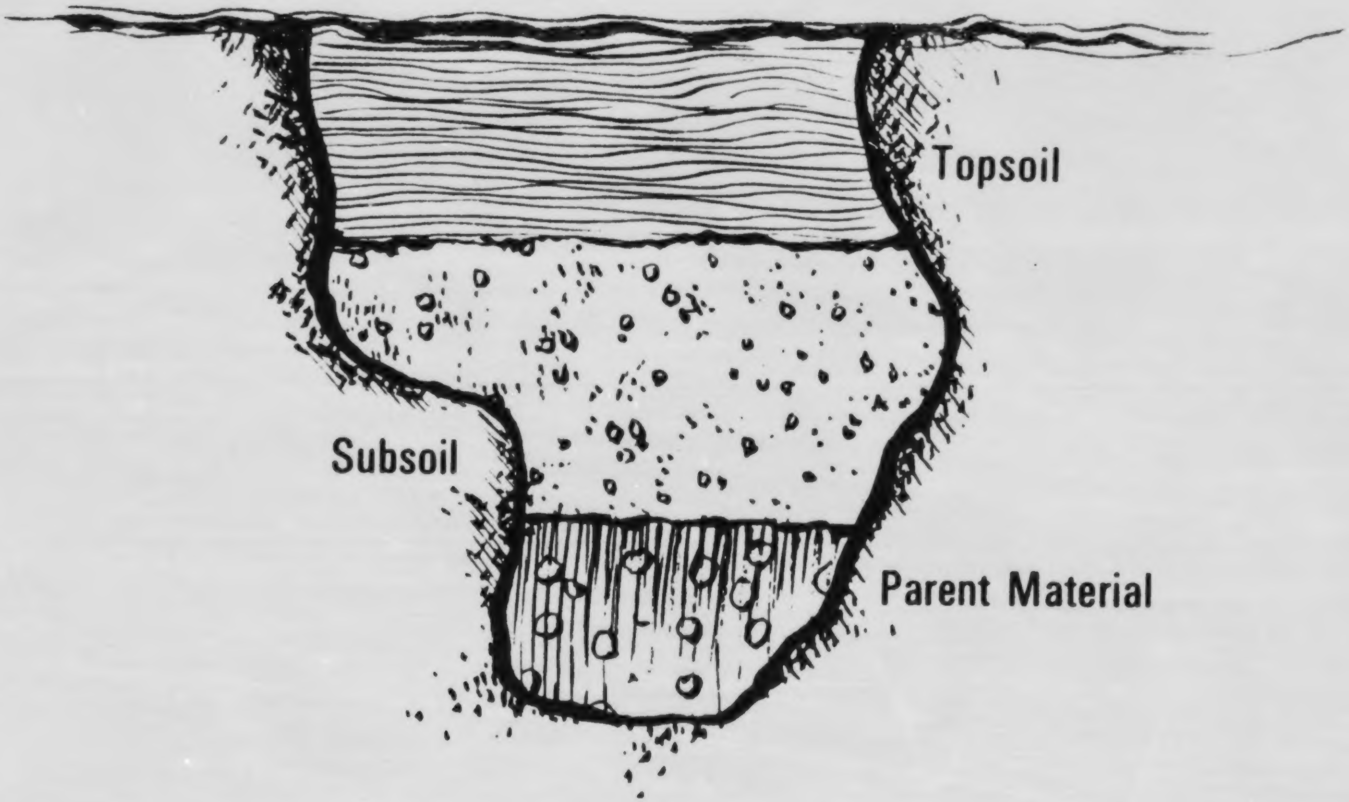
Soil Particles


Sand
Silt
Clay

Ag. II - 13-D

TM 2

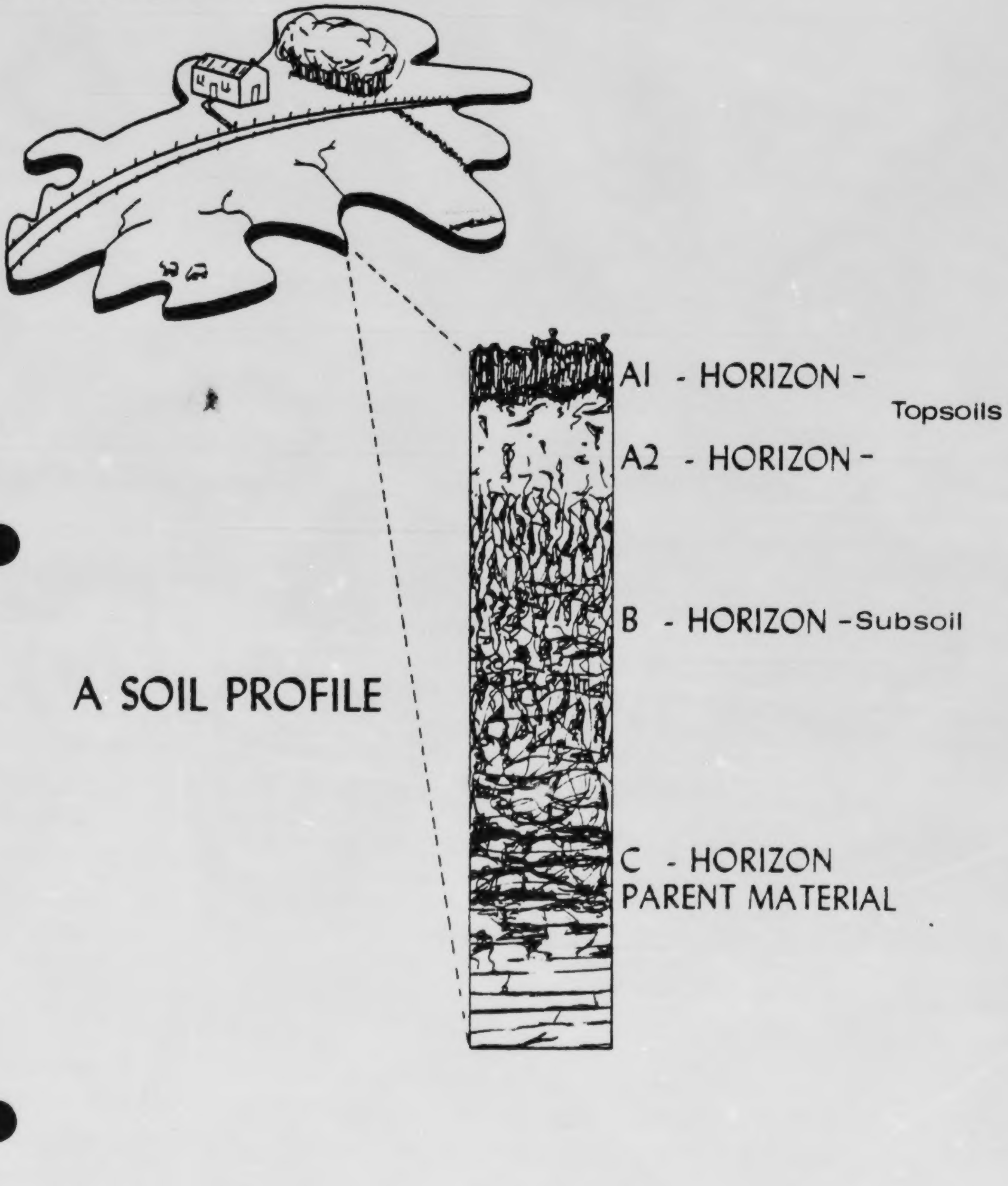
Soil Profile


Topsoil
Subsoil
Parent Material

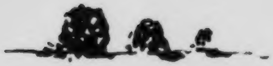
TM 3

Ag. II - 15-D

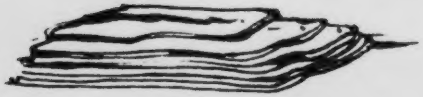
A SOIL BODY


A SOIL PROFILE
A1 - HORIZON -
Topsoils
A2 - HORIZON -
B - HORIZON -Subsoil
C - HORIZON
PARENT MATERIAL

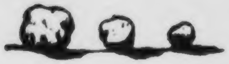
Soil Structure



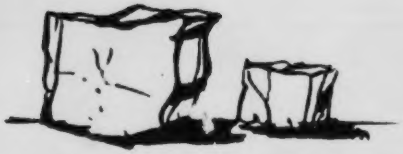
Crumb



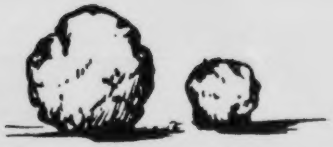
Platy



Granular

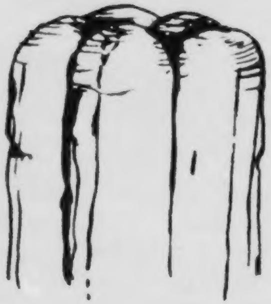


Angular Blocky

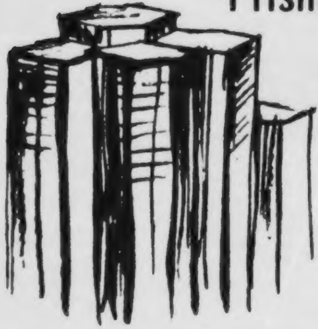


Subangular Blocky

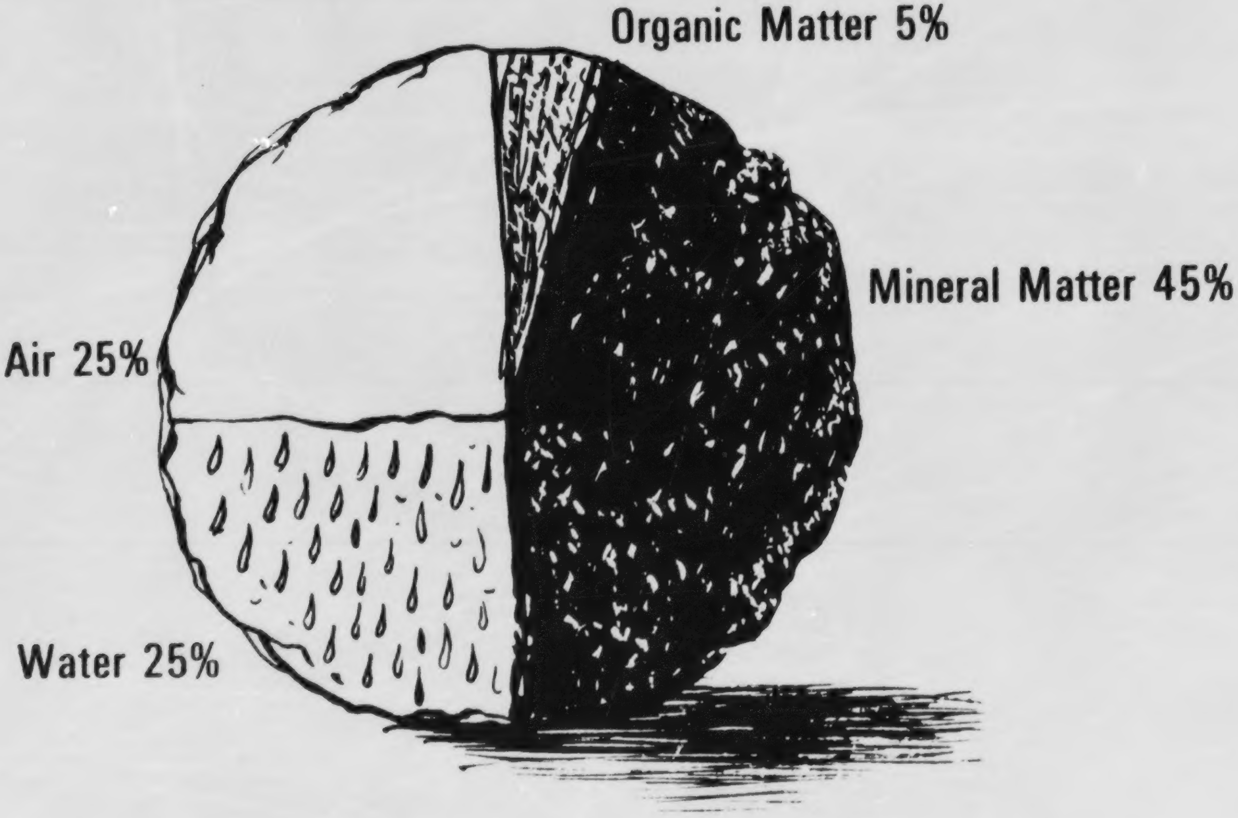
Columnar



Prismatic



Composition of Average Soil



TM 6

Ag. II - 21-D

ELEMENTARY STUDY OF SOILS
UNIT I

ASSIGNMENT SHEET #1 - STUDY OF MY COUNTY SOIL

Answer the following questions about your county's soil.

1. List the general topography of your county soils.

2. Identify the major soil groups (types) found within the county.

3. List the major characteristics of the soil groups found in your county.

ELEMENTARY STUDY OF SOILS

TEST

1. Define the following:
    a. Soil -
    b. Soil Texture -
    c. Rock -
    d. Aggregate -
    e. Soil Structure -

2. Name three reasons why soils are important.
    a.
    b.
    c.

3. Name five factors that aid in soil formation.
    a.
    b.
    c.
    d.
    e.

4. a. A reaction caused by temperature change such as heating and cooling is known as ______________ weathering.
    b. A reaction caused by water and oxygen is known as _________ weathering.

5. What are five benefits of having organic matter in the soil?
    a.
    b.
    c.
    d.
    e.

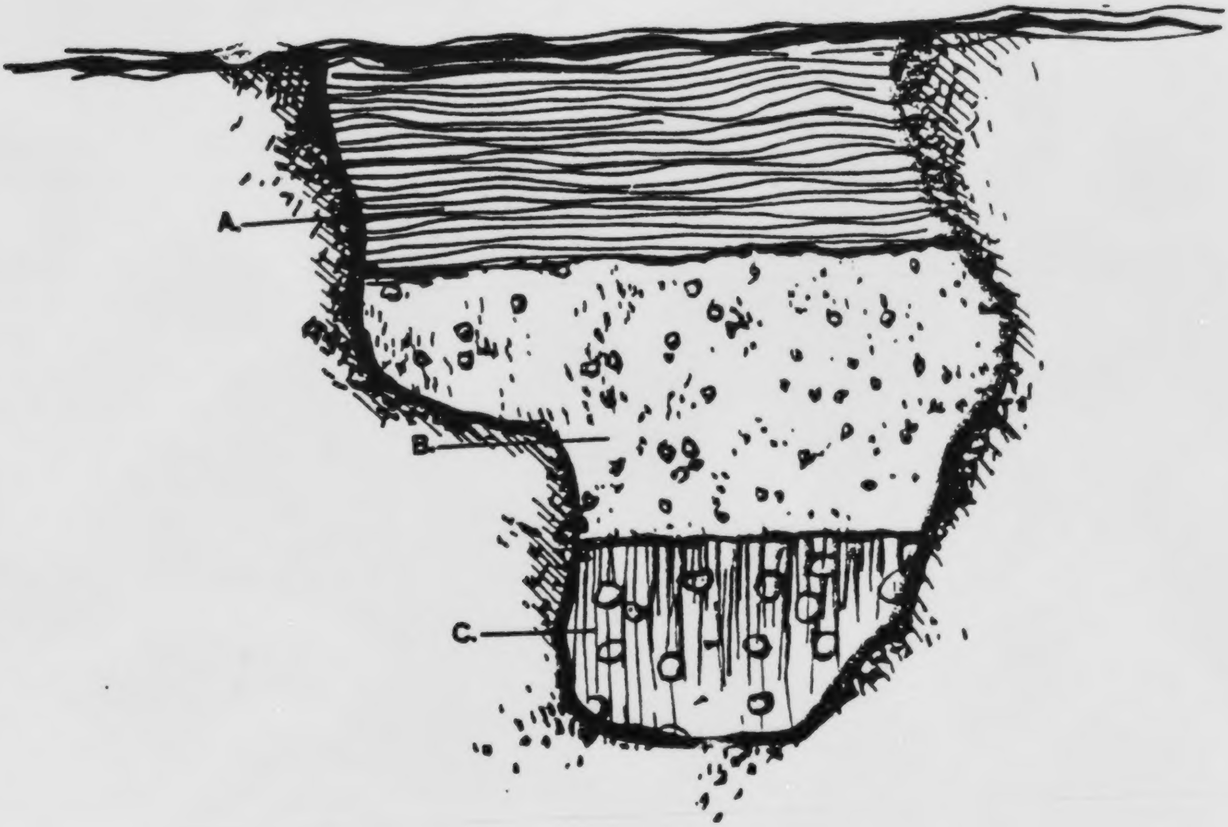
6. Name the three soil particles.

   a.

   b.

   c.

7. Label the drawing below.

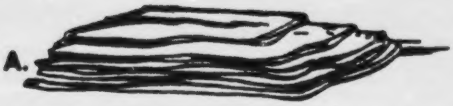


a. ______________________________

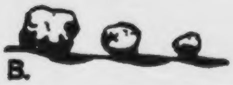
b. ______________________________ _

c. ______________________________

8. Identify the different kinds of soil structures below.



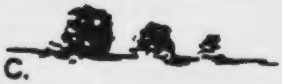
A.



B.

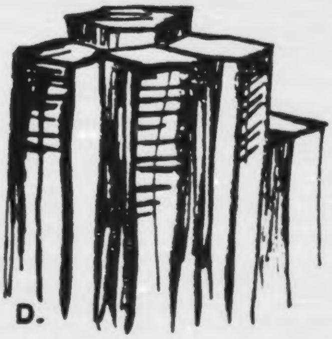
a.________________________

b.________________________



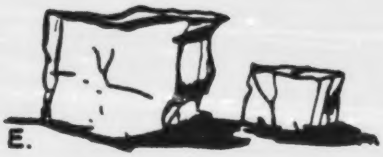
C.

c.________________________



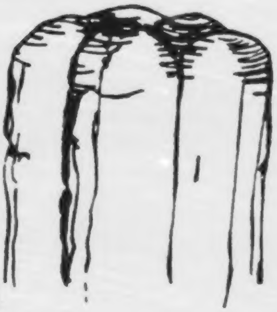
D.

d.________________________



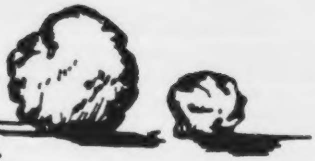
E.

e.________________________



F.

f.________________________



G.

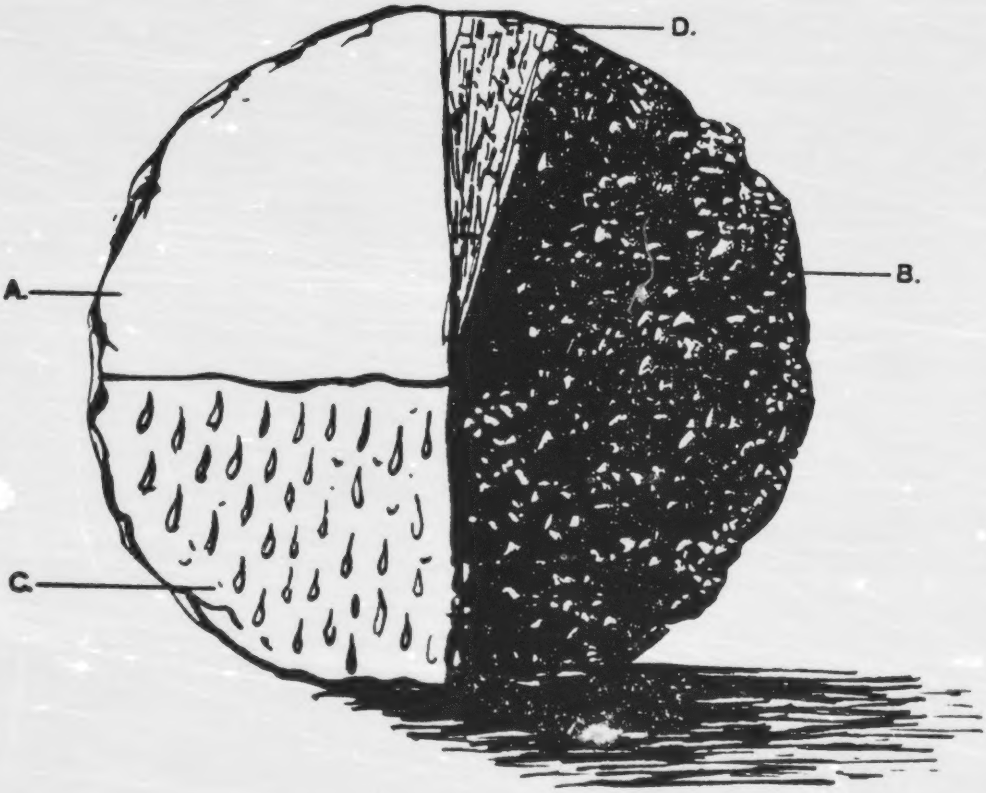
g.________________________

9. Match the terms on the left with the statements on the right.

_____a. Yellow
_____b. Gray
_____c. Black - Dark Brown
_____d. Red or Reddish Brown

1. Low organic matter
2. Most productive soil
3. Caused by poor drainage
4. Less fertile than black or dark brown soil

10. Label the drawing below indicating the composition of average soil.



a. ____________________________
b. ____________________________
c. ____________________________
d. ____________________________

11. Match the terms on the left with the statements on the right indicating slope, erosion, permeability, and soil depth.

A. Slope

_____1. Gently sloping
_____2. Nearly level
_____3. Steep
_____4. Moderately sloping
_____5. Very steep
_____6. Strongly sloping

a. 3 to 5 feet fall/100 feet
b. More than 12 feet fall/100 feet
c. 8 to 12 feet fall/100 feet
d. 5 to 8 feet fall/100 feet
e. Less than 1 foot fall/100 feet
f. 1 to 3 feet fall/100 feet

B. Erosion

_____1. Severe
_____2. None to slight
_____3. Moderate
_____4. Very severe

a. Less than 25 percent surface soil removed with no gullies
b. 75 percent or more of the surface soil removed with occasional uncrossable gullies and/or severe accumulation by wind
c. 75 percent or more of surface soil removed with frequent uncrossable gullies and/or severe accumulation by wind
d. 25 to 75 percent of surface soil removed with or without gullies

C. Permeability

_____1. Slow
_____2. Rapid
_____3. Very slow
_____4. Moderate

a. Soils that have sandy subsoils
b. Soils that have highly granular, clay loam subsoils
c. Soils that have dense, heavy clay or clay pan subsoils
d. Soils that have crumbly, clayey subsoils

D. Depth

_____1. Shallow
_____2. Deep
_____3. Very shallow
_____4. Moderately deep

a. Less than ten inches deep
b. Twenty to thirty-six inches deep
c. Ten to twenty inches deep
d. More than thirty-six inches deep

SOIL CONSERVATION PRACTICES
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinguish between wind and water erosion and be able to recognize damage caused by erosion. The student should be able to establish conservation practices on his or her farm and in his or her community. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion, the student should be able to:

1. Define five terms associated with soil conservation practices.
2. Name the two types of erosion.
3. Name five conservation practices that are effective in reducing wind erosion.
4. List the four categories of water erosion.
5. List two physical factors that influence erosion.
6. Recognize factors that determine the type of cropping systems to use.
7. Name five management practices that aid in the control of erosion.
    A. Name two common types of terraces and their main functions.
    B. Name the best method of farming, yet maintaining terraces.
8. Survey your home farm to see how you rate as an FFA conservationist.
9. Survey your home community. List ten examples of poor conservation practices.

SOIL CONSERVATION PRACTICES
UNIT II

INFORMATION SHEET

I. Terms and definitions

  A. Erosion - The removal of topsoil by wind and water.

  B. Water Outlet - A ditch which carries the excess water of the farm.

  C. Terracing - A structure designed to slow down running water and control erosion on sloping land.

  D. Crop Rotation - The rotation of a field from a row crop to a sod type crop.

  E. Strip Cropping - The practice of planting crops in narrow strips, in which close-growing crops are grown next to cultivated crops.

  F. Diversion Ditches - Ditches which prevent erosion by diverting water around a field rather than across.

  G. Cover Crop - A crop used to cover the soil surface to decrease erosion.

  H. Waterway - Protected seeded channels, usually broad and slightly sloping into which the water carried by the terraces is dumped.

II. Types of erosion

  A. Wind

  B. Water

III. Wind erosion control measure (Transparency 1)

  A. Stubble mulching

  B. Strip cropping

  C. Prevention of burning

  D. Prevention of overgrazing

  E. Moisture conservation

  F. Emergency cover crops

  G. Emergency tillage operations

  H. Wind break tree planting

  I. Shelter belt of trees

IV. Categories of water erosion
A. Splash
B. Sheet
C. Rill
D. Gully

V. Physical factors that influence erosion
A. Amount of and intensity of rainfall and wind
B. Type and condition of vegetative cover
C. Nature of the soil
D. Slope of the land

VI. Factors determining cropping systems
A. Slope
B. Erodibility
C. Drainage
D. Moisture
E. Depth
F. Fertility
G. Economics

VII. Erosion control (Transparencies 2, 3, and 4)
A. Use of land
B. Water control systems
1. Terracing
2. Diversion ditch
3. Strip cropping
4. Crop rotation
5. Water outlets
6. Row directions
7. Farming on contour
C. Cover crops
D. Control of gullies
E. Fertilizer

VIII. Common types of terraces and their primary function

A. Channel - Primarily a drainage channel, has a wide, shallow channel

B. Ridge - Primarily used to increase water absorption, used in areas of low rainfall

C. Bench - Used on very steep slopes to slow down flow of runoff water

IX. Farming terraced land

(NOTE: Always farm on contour - plow and plant parallel to the terraces.)

WIND EROSION CONTROL MEASURES

A. STRIP CROPPING

B. PREVENTION OF BURNING

C. PREVENTION OF GRAZING

D. MOISTURE CONSERVATION

E. EMERGENCY COVER CROPS

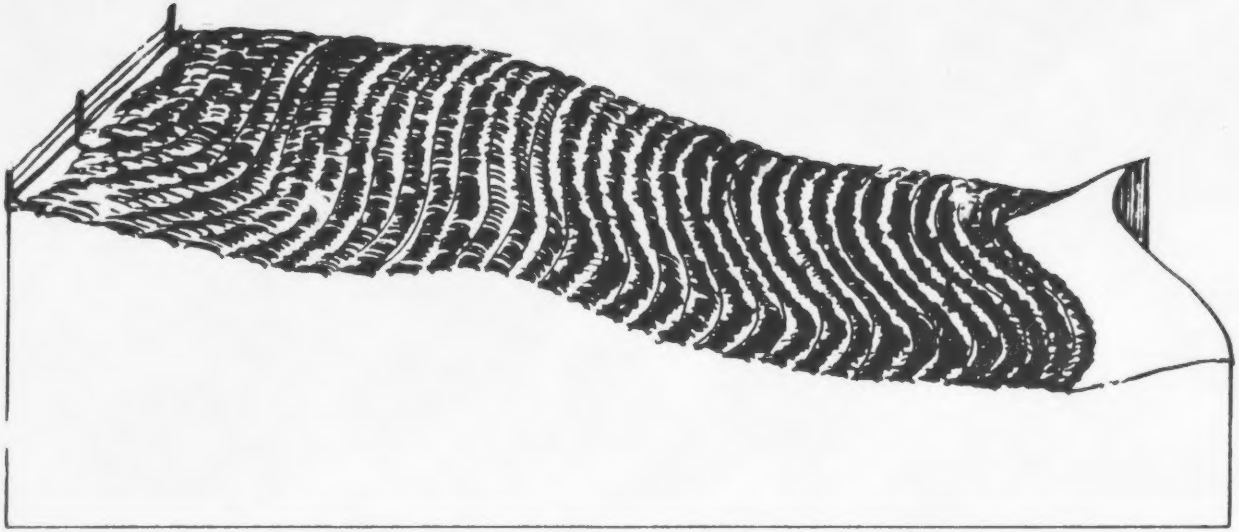
F. EMERGENCY TILLAGE OPERATIONS

G. WIND BREAK TREE PLANTING

H. SHELTER BELT OF TREES

I. STUBBLE MULCHING

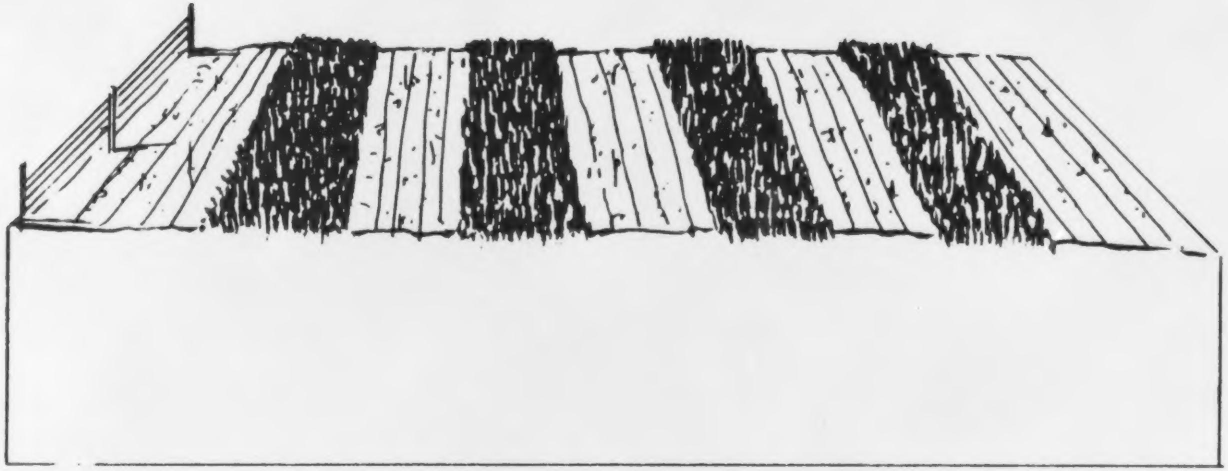
Terracing for Erosion Control



Ag. II - 45-D

TM 2

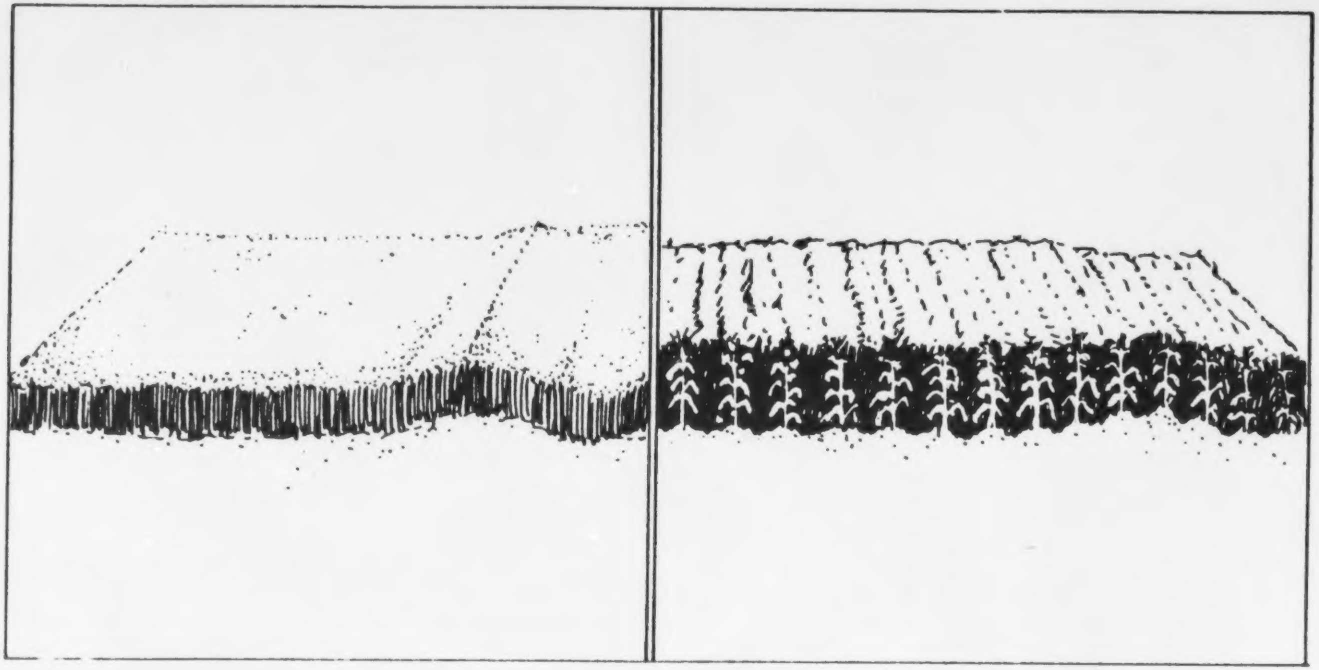
Strip Cropping for Erosion Control



Ag. II - 47-D

TM 3

Crop Rotation for Erosion Control



SOIL CONSERVATION PRACTICES
UNIT II

ASSIGNMENT SHEET #1 - LOCATING POOR CONSERVATION PRACTICES

Survey your home community and list ten examples of poor conservation practices.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

SOIL CONSERVATION PRACTICES
UNIT II

TEST

1. Define the following terms:
   - a. Terracing -
   - b. Cover Crop -
   - c. Erosion -
   - d. Diversion Ditch -
   - e. Water Outlet -

2. What are the two types of erosion?
   - a.
   - b.

3. Name five conservation practices that are effective in reducing wind erosion.
   - a.
   - b.
   - c.
   - d.
   - e.

4. Name the four categories of water erosion.
   - a.
   - b.
   - c.
   - d.

5. Name two physical factors that influence erosion.
   - a.
   - b.

6. Place an "X" beside the term or phrase that aids in determining the type of cropping system to use.

   _____a. Moisture

   _____b. Temperature

   _____c. Fertility

   _____d. Slope

   _____e. Drainage

7. Name five management practices that aid in the control of erosion.

   a.

   b.

   c.

   d.

   e.

8. Name two common types of terraces and their main functions:

Terrace Name	Function
a.	
b.	

9. Name the recommended method of farming terraces and terraced land.

PLANT GROWTH AND REPRODUCTION
UNIT III

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize the processes involved in plant growth and reproduction. The student should be able to identify and recognize the functions of the principal parts of plants and be able to recognize some of the causes of poor seed germination. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion, the student should be able to:

1. Define five terms associated with plant growth and reproduction.
2. Label the important parts of a plant from a drawing and discuss two functions of each part.
3. Distinguish between the two main types of root systems.
4. Label a drawing showing the different parts of a plant stem.
5. Recognize and name the stages of seed germination.
6. Name the requirements for good seed germination.
7. List three factors that cause poor seed germination.
8. Recognize and list the substances that have to be present before photosynthesis will occur.
9. Recognize and list the steps in the process of manufacturing of plant food with photosynthesis.
10. Name three ways a plant absorbs nutrients.
11. Distinguish between photosynthesis and respiration.
12. Label a drawing showing the parts of a complete flower.
13. Recognize methods of pollination.
14. Name five methods of vegetative reproduction.

PLANT GROWTH AND REPRODUCTION
UNIT III

INFORMATION SHEET

I. Terms and definitions

A. Germination - The changing of a dormant embryo to active status

B. Fertilization - The union of the male (pollen) nucleus with the female (egg) cell

C. Pollination - The transfer of pollen from the anther to the stigma

D. Embryo - The rudimentary plantlet within seed; the germ

E. Pollen - The male sex cells produced in the anthers of flowering plants

F. Pistil - The seed-bearing organ of a flower composed of the ovary, style, and stigma

G. Photosynthesis - The process by which carbohydrates are manufactured by the cholorphyll-bearing cell granules from CO_2 and water by means of the energy of sunlight

H. Ovule - The female sex cell with the immediate surrounding parts; the future seed

I. Respiration - The taking in of oxygen and giving off of carbon dioxide

J. Transpiration - The evaporation of moisture through the leaves

K. Chlorophyll - The green vegetable pigment of plants essential in the process of photosynthesis

L. Monocotyledon - A plant having one cotyledon, as in grasses

M. Dicotyledon - A plant which produces two seed leaves

N. Imperfect flower - A flower lacking either stamens or pistils

O. Perfect flower - Having both pistil and stamens

P. Monoecious plant - Both sexes present on same plant

Q. Dioecious plant - Sexes are on different plants

R. Rhizome - Plant stems horizontal below ground; usually sending up a plant and sending down roots at the node

S. Seed inoculation - The application of nitrogen fixing bacteria to the seed of legumes or to the soil in which legumes are to be grown

T. Secondary root - A branch of the main root

- U. Primary root - The root that develops when the seed germinates and grows from the lower end of the embryo
- V. Stolen - A horizontal above ground stem which produces a plant with root and shoot at the nodes. Examples of stolens are strawberries and bermuda grass
- W. Plumule - The small stem like primary bud of an embryo or germinating seed plant. It emerges from the ground and develops tree leaves
- X. Scarification - The process of scratching and/or cutting hard seed coats to allow for greater germination rates

II. Plant parts (Transparency 1)

- A. Roots
  - 1. Absorb water and minerals
  - 2. Store food
  - 3. Anchor plant
- B. Stem
  - 1. Supports leaves
  - 2. Aids in manufacturing plant food from leaves
  - 3. Serves as food storage areas
- C. Leaf
  - 1. Manufactures food for the plant
  - 2. Transpiration (evaporation of water)
  - 3. Serves as food storage
- D. Bud or flower
  - 1. Reproduction
  - 2. Stores food - seeds and fruits

III. Root types (Transparency 2)

- A. Tap
  - 1. Cotton
  - 2. Alfalfa
- B. Fibrous
  - 1. Grasses
  - 2. Cereal grains

IV. Steps of germination (Transparencies 3 and 4)
A. Absorption of water and oxygen into seed
B. Seed swells and seed coat ruptures
C. Primary (temporary) root goes down
D. First internode goes up
E. New leaves form and food production starts

V. Requirements for seed germination
A. Proper temperature
1. Ranges from 32 to 120 degrees Fahrenheit
2. Most seeds germinate from 68 to 86 degrees Fahrenheit
B. Sufficient moisture
C. Ample supply of oxygen

VI. Causes of poor seed germination
A. Mechanical injury (cracked grain drying too fast)
B. Disease
C. Storage conditions
D. Old seed
E. Temperature too cold
F. Hard seed coat (scarify hard-coated legumes)
G. Drying out of soil
H. Planting too deep
I. Chemical damage (fertilizer)
J. Immature seed

VII. Requirements of photosynthesis
A. Light, CO_2, water essential nutrients
B. Favorable temperature
C. Living cells containing chlorophyll

VIII. Steps of photosynthesis (Transparency 5)
A. CO_2 taken in by leaves

B. H_2O taken in by roots

C. $CO_2 + H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + O_2$

D. Plants convert sugar to starch or reverse the process as needed to build protein, fats, or energy

IX. Absorption of nutrients and water

A. Diffusion - The movement of gases or liquids from an area of higher concentration to an area of lower concentration

B. Osmosis - The movement of a substance from the place of greater concentration through a thin, semi-permeable membrane to the place of lesser concentration

C. Non-root feeding - Nutrients and water entering plant through leaves and stems

X. Means of pollination (Transparencies 6,7, and 8)

A. Gravity

B. Wind

C. Insect

D. Man

1. Hybrids - The first generation offspring of a cross between two inbred lines

   a. Single cross - the progeny obtained by crossing two inbred lines

   b. Double cross - the progeny resulting from crossing two single crosses

2. Mechanical pollination

E. Animals

F. Birds

XI. Parts of flower (Transparencies 9 and 10)

A. Pistil - Female part where egg cells originate

1. Stigma - Upper part of pistil which holds pollen
2. Style - Supports stigma
3. Ovary - Produces ovule or ovules which develop into seed or seeds

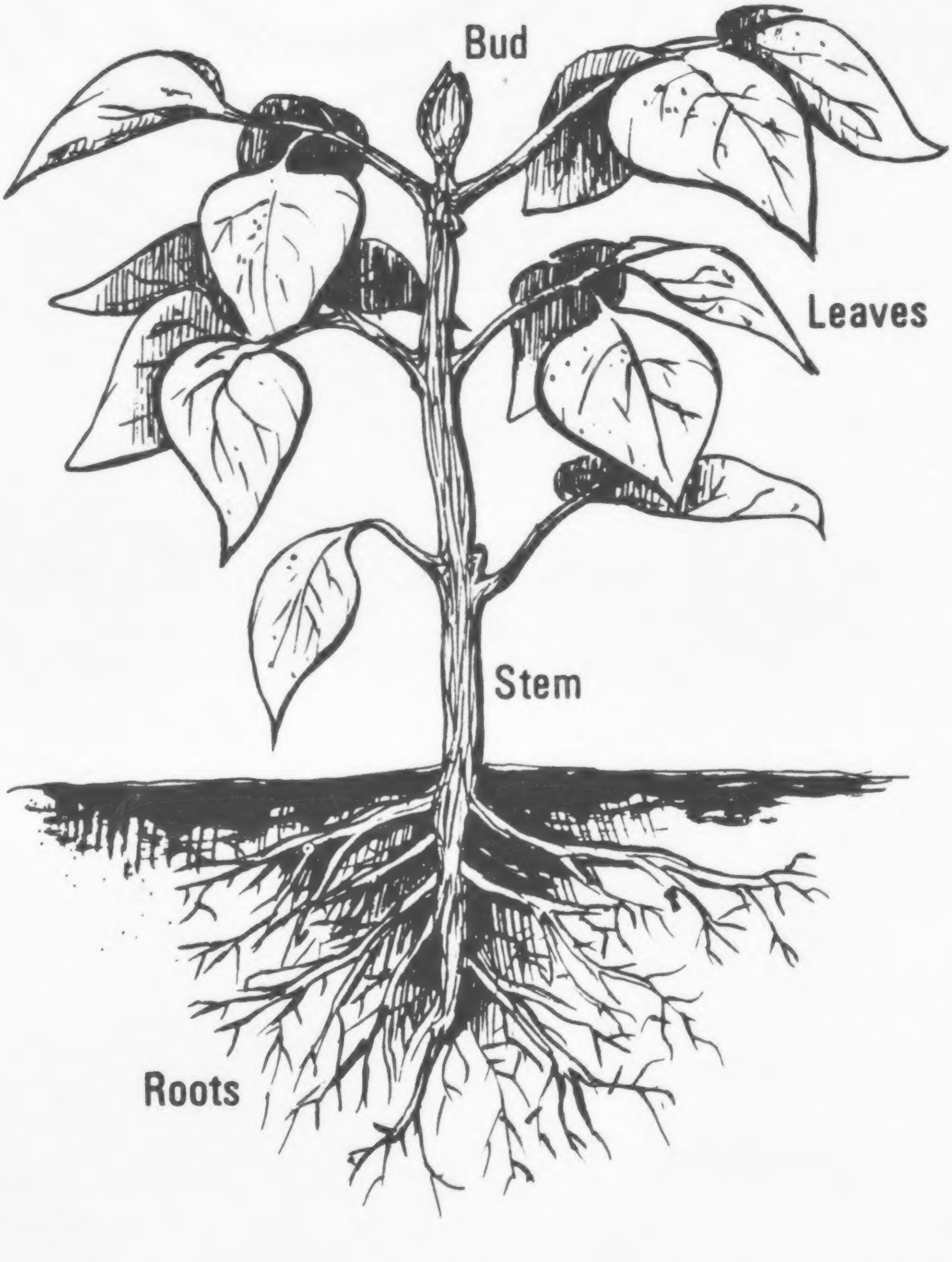
B. Stamen - Male part of flower

1. Filament - Supports anther
2. Anther - Bears the pollen

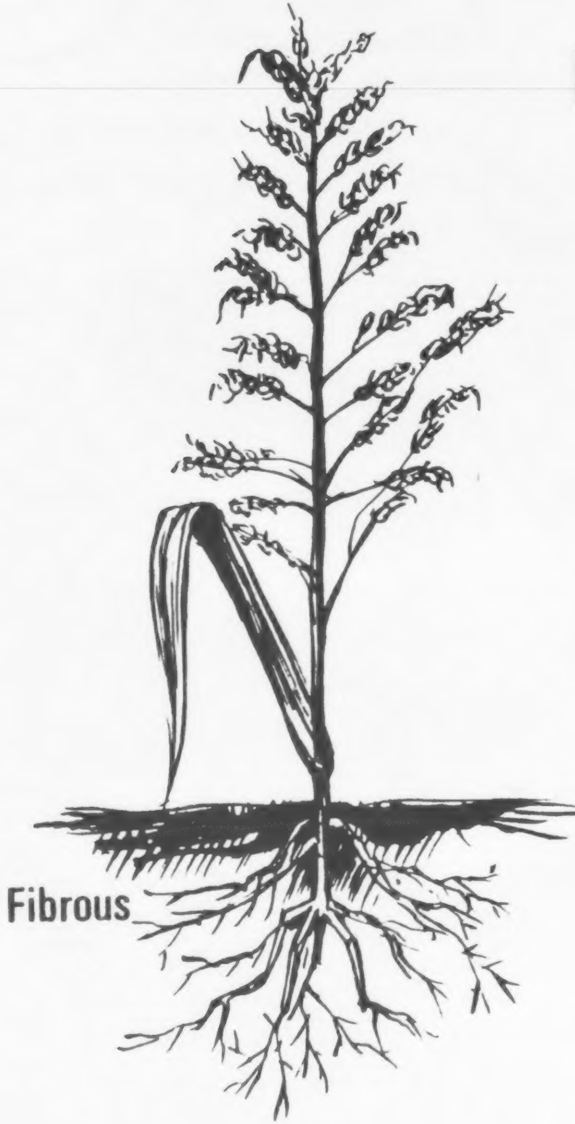
C. Accessory organs - Protect the essential organs of the plant
  1. Corolla - Petals of the flower
  2. Calyx - Located below the petals
  3. Receptacle - Top part of lower stalk
  4. Micropyle - Opening of pollen tubes

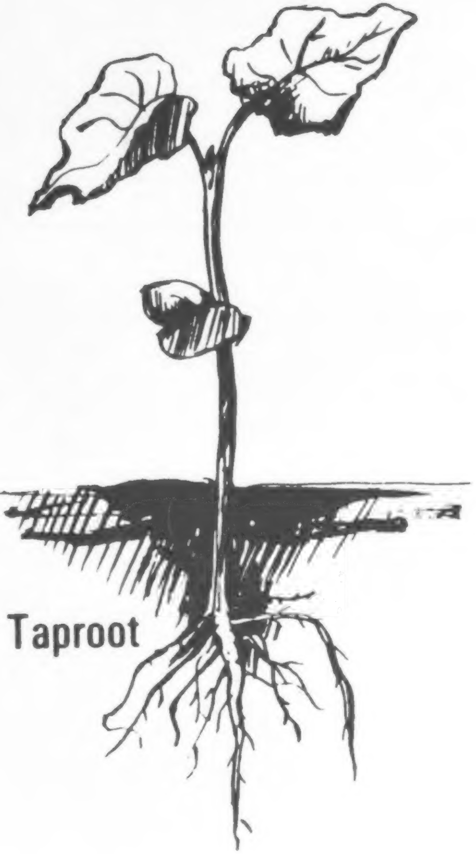
XII. Vegetative reproduction
  A. Tubes
  B. Roots
  C. Stolon
  D. Stem
  E. Rhizomes

Parts of Plant

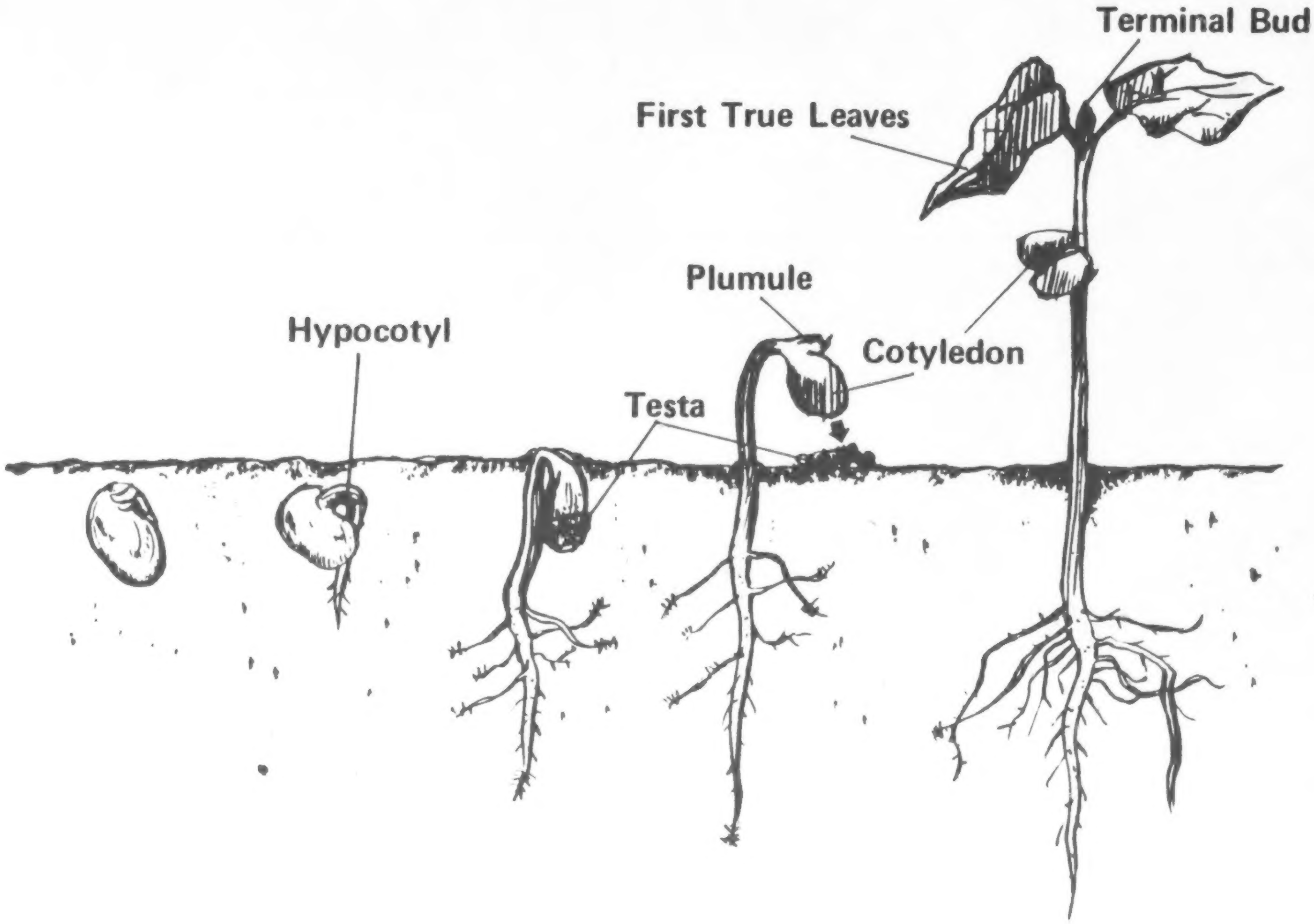

Bud
Leaves
Stem
Roots

Root Types





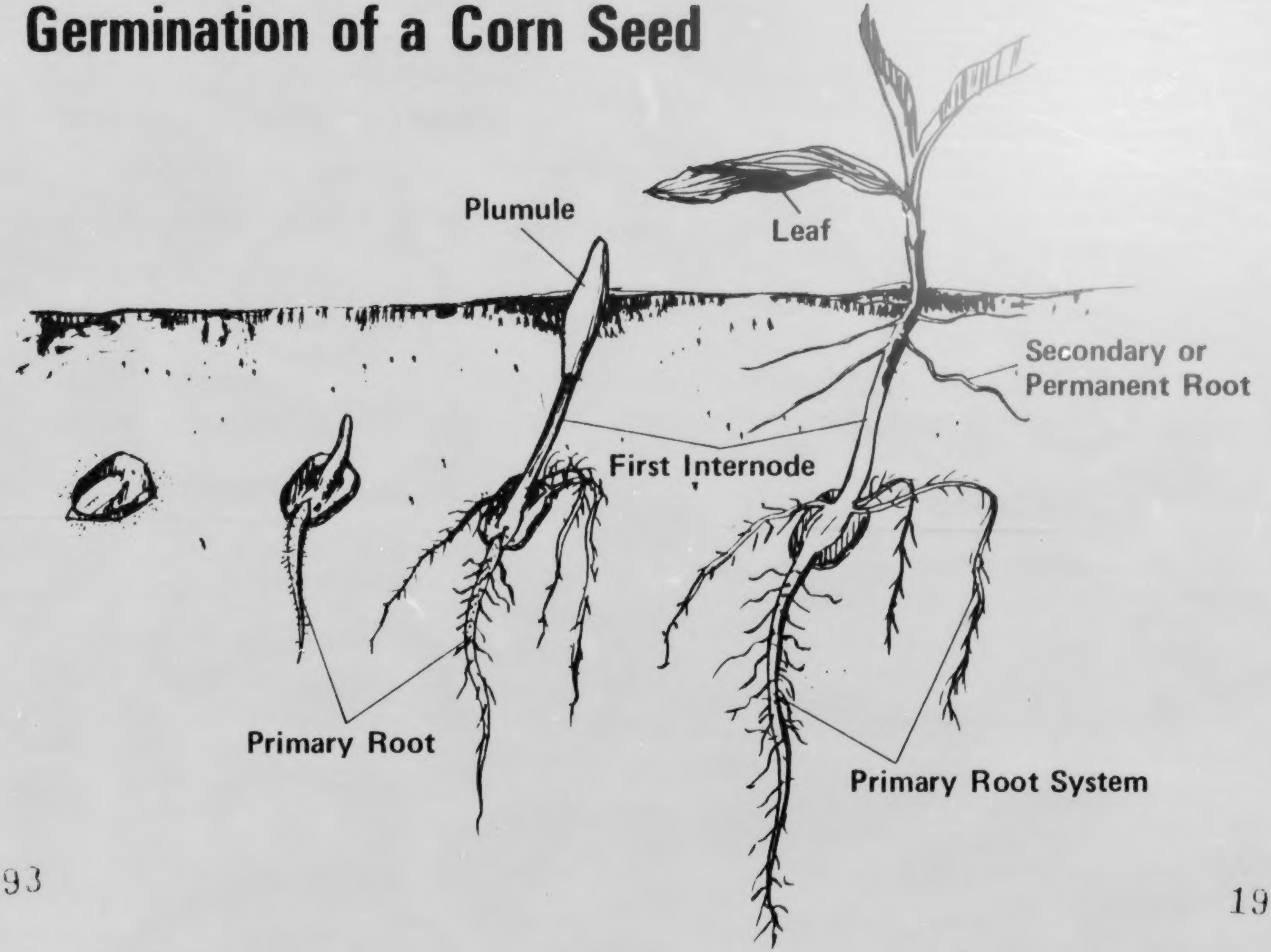
Germination of a Bean Seed


Terminal Bud
First True Leaves
Plumule
Hypocotyl
Cotyledon
Testa

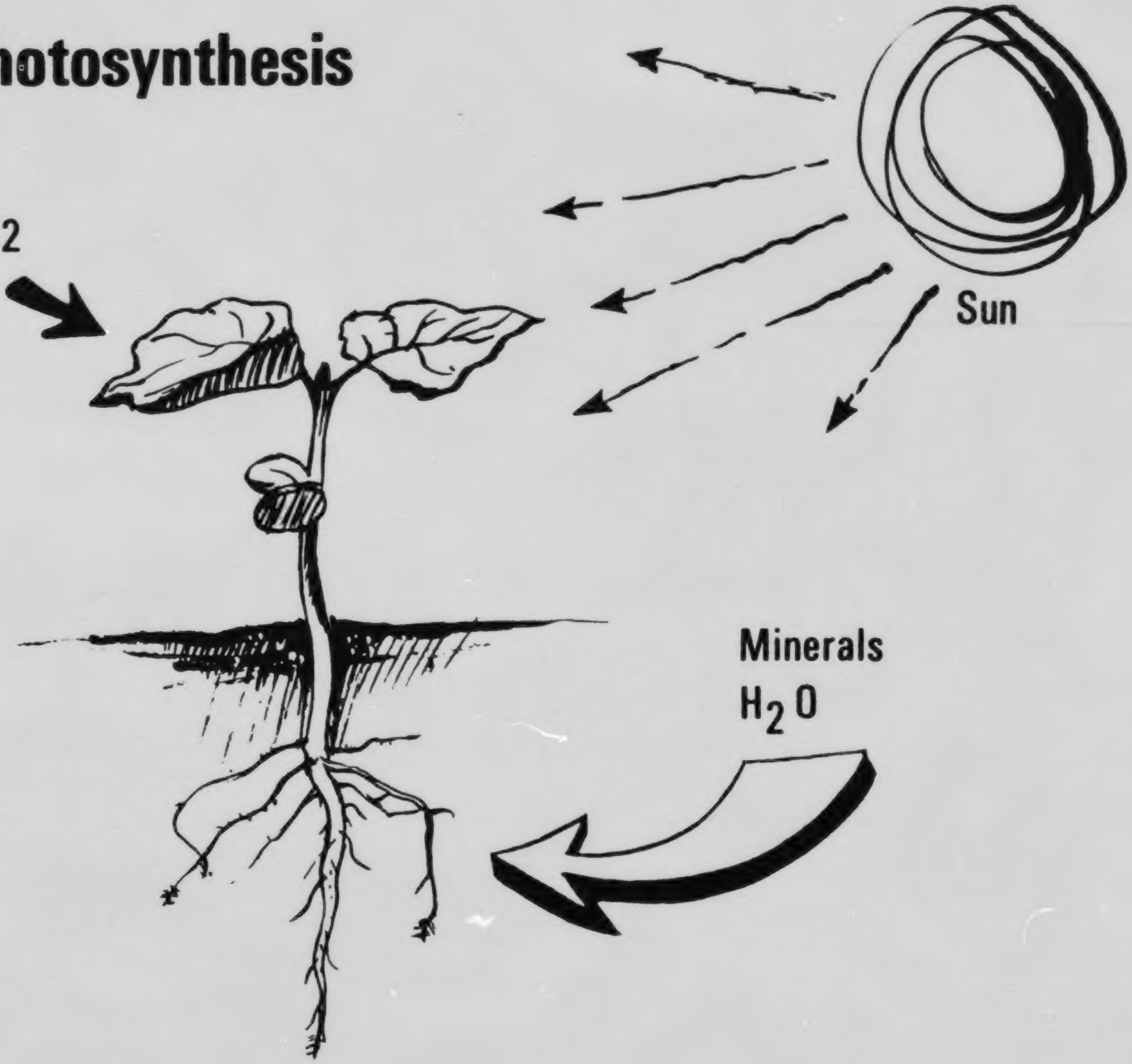
Ag. II - 71-D

TM 3

Germination of a Corn Seed


Plumule
Leaf
Secondary or
Permanent Root
First Internode
Primary Root
Primary Root System

Photosynthesis



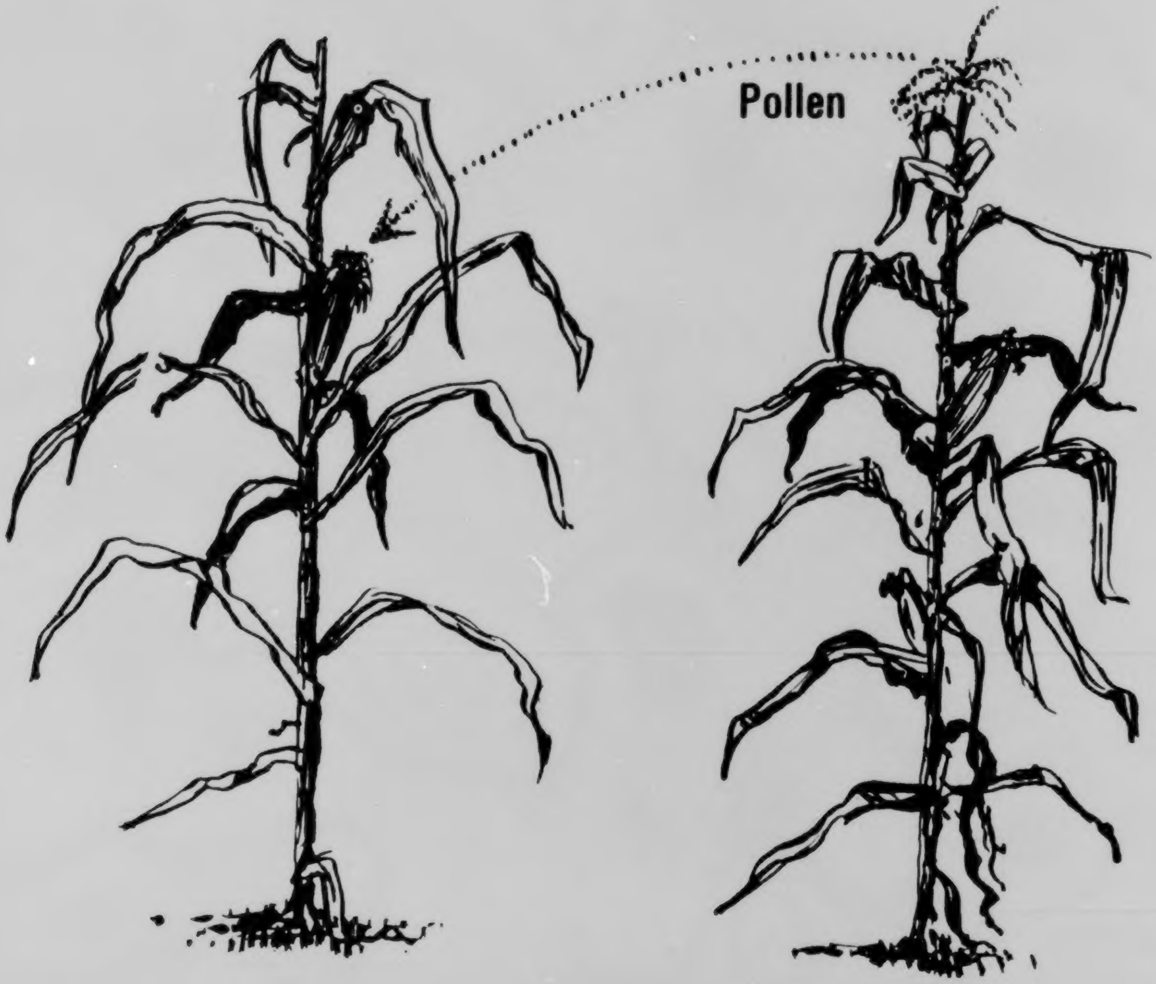
CO_2

Sun

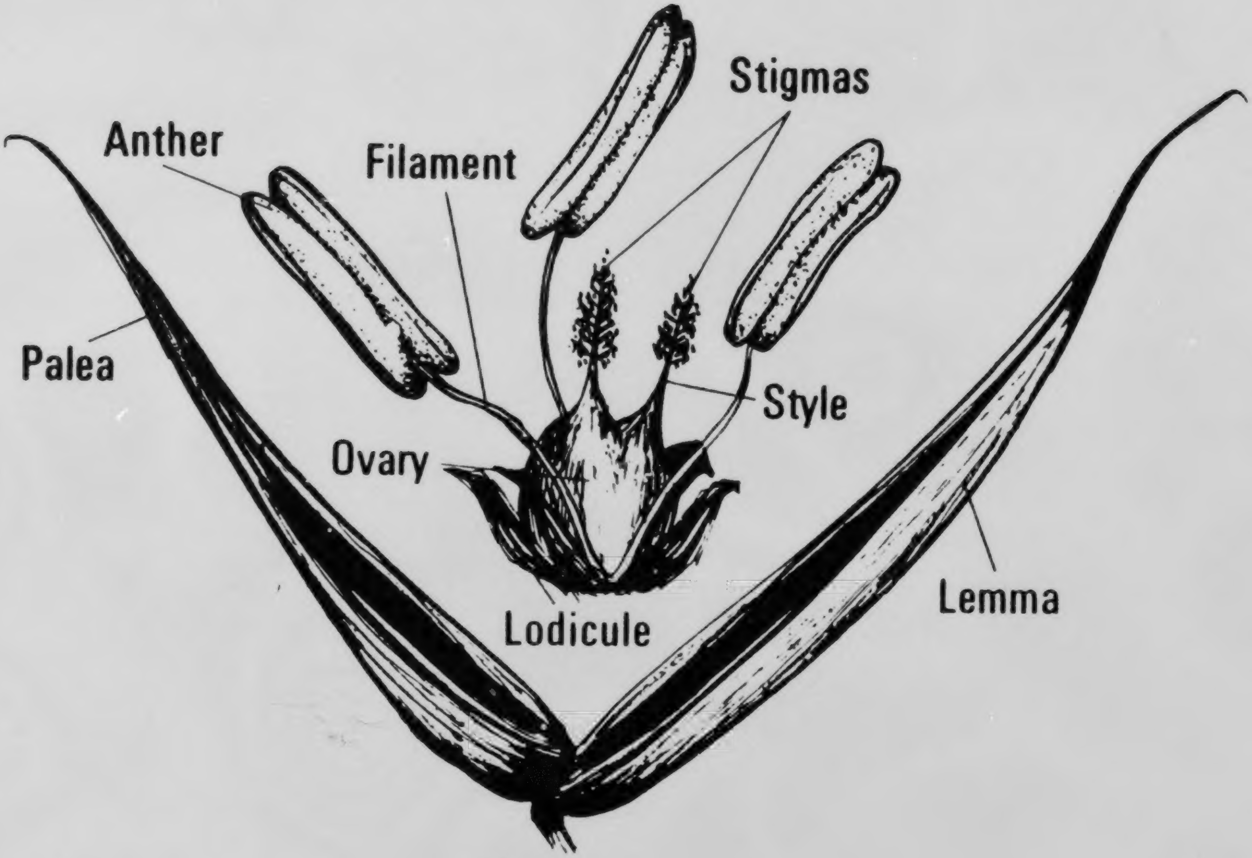
Minerals

H_2O

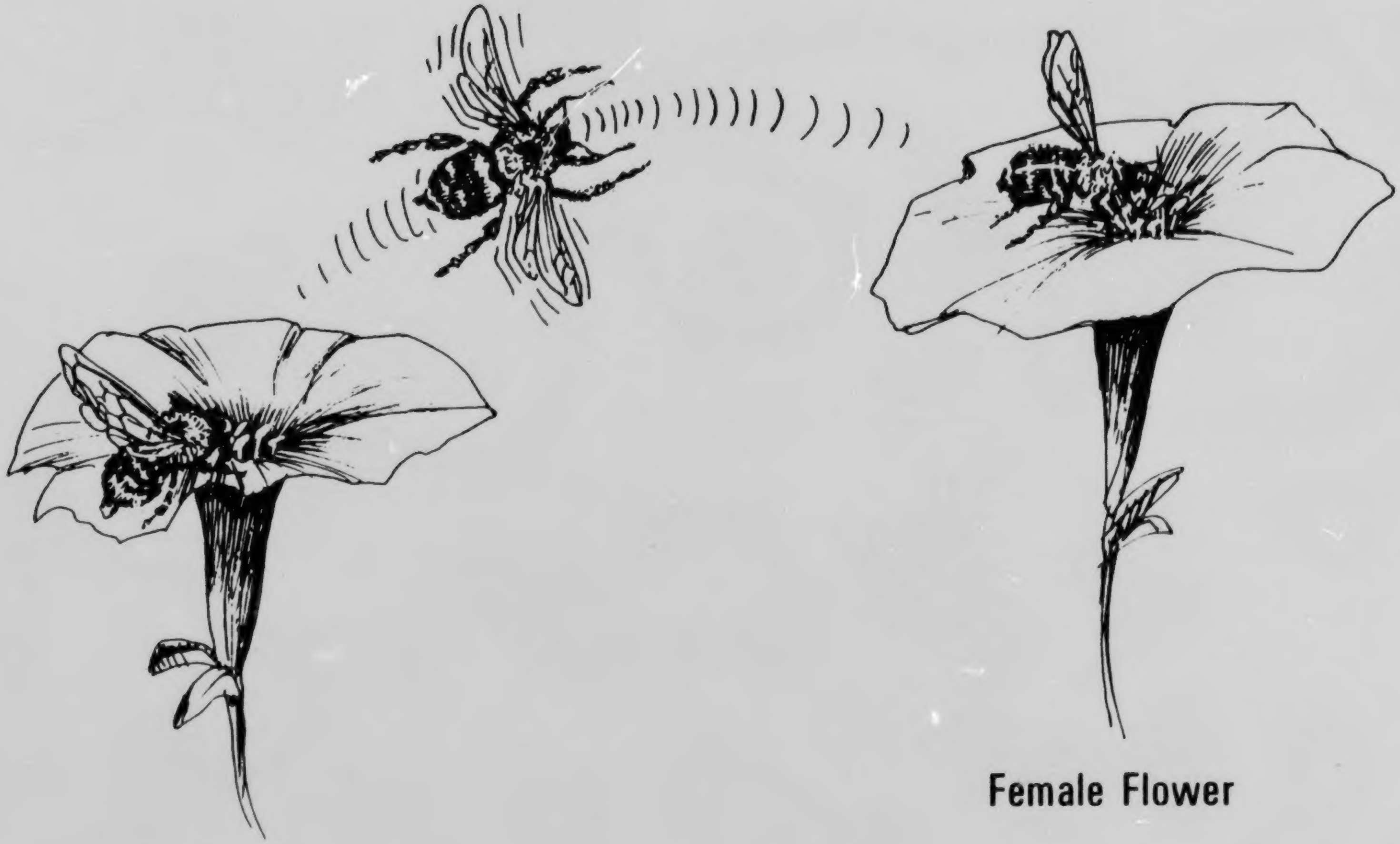
Cross Pollination



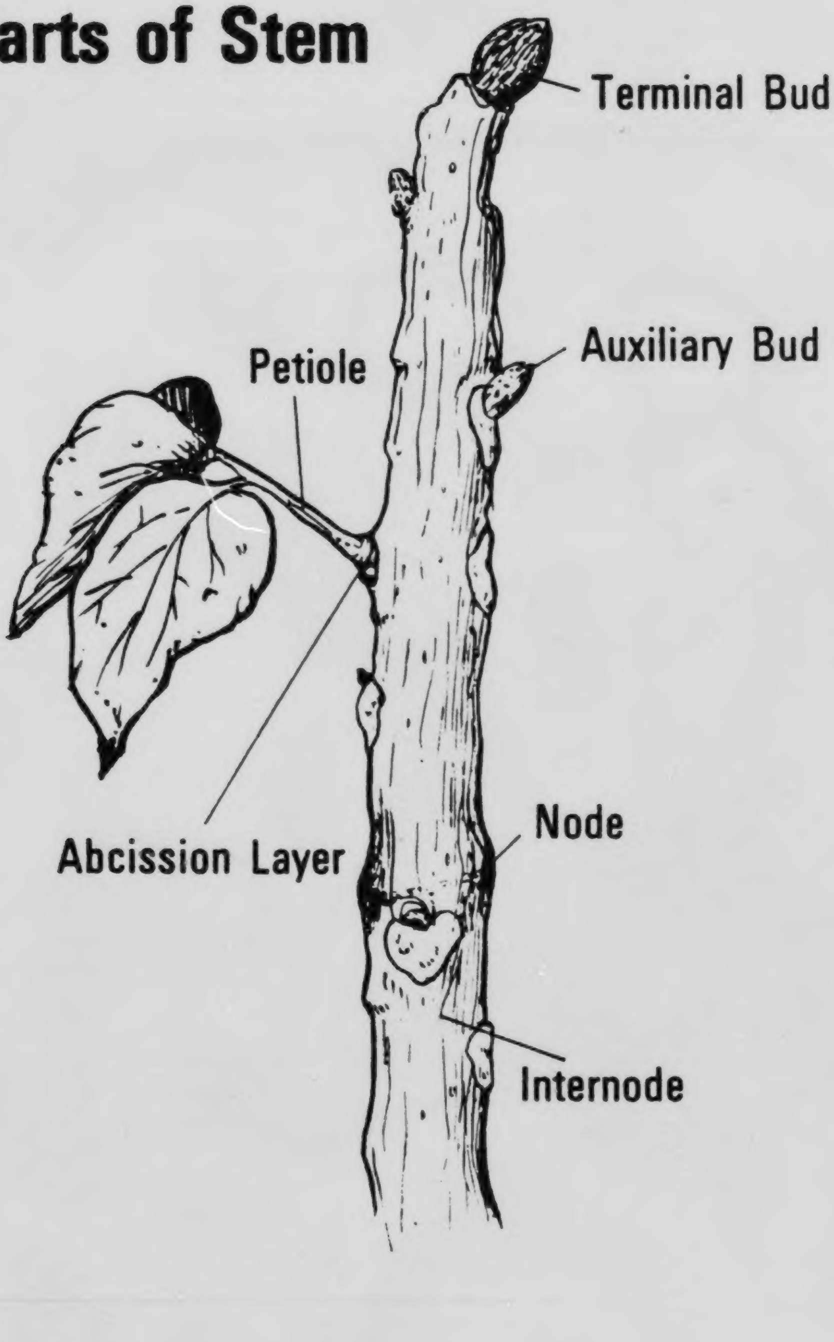
Self-Pollination


Stigmas
Anther
Filament
Palea
Style
Ovary
Lemma
Lodicule

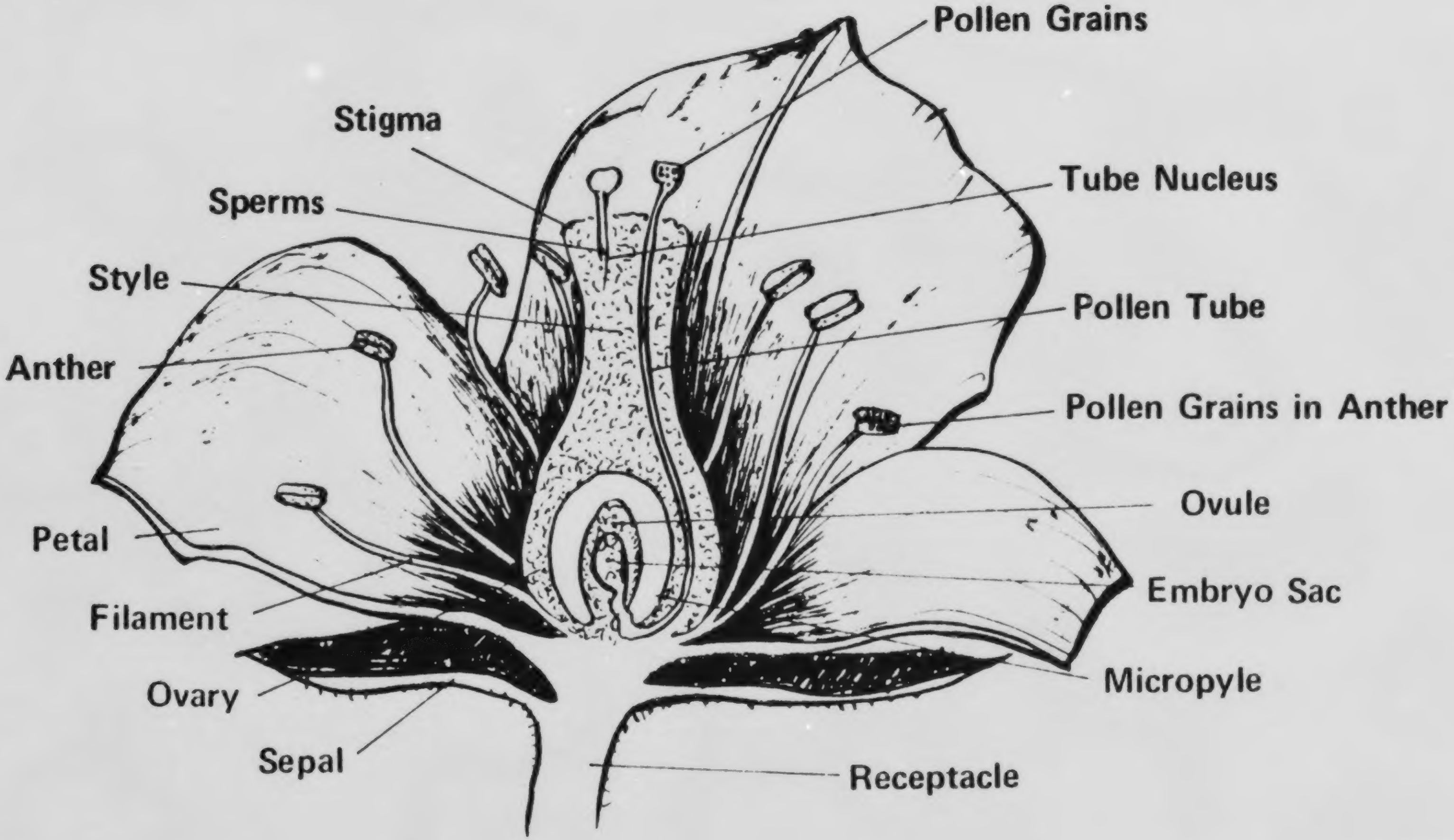
Pollination by Insects


Male Flower
Female Flower

Parts of Stem


Terminal Bud
Auxiliary Bud
Petiole
Abcission Layer
Node
Internode

Parts of a Flower



Pollen Grains
Stigma
Tube Nucleus
Sperms
Style
Pollen Tube
Anther
Pollen Grains in Anther
Ovule
Petal
Embryo Sac
Filament
Micropyle
Ovary
Sepal
Receptacle

Respiration vs. Photosynthesis

A Destruction Process	A Building Process
Food Consumed	Food Manufactured
Energy is Released	Sun Provides Energy
CO_2 Given Off	CO_2 Taken in Plant
Oxygen Used	Oxygen Given Off
Simple Compounds Form	Complex Compounds Form
Produces CO_2 and H_2O	Produces Sugars, Starches
Goes on Day and Night	Requires Light
Carried on in all Cells	Chlorophyll Must be Present

Ag. II - 87-D

PLANT GROWTH AND REPRODUCTION
UNIT III

TEST

1. Define the following terms:
   a. Pollination -
   b. Respiration -
   c. Dicotyledon -
   d. Pollen -
   e. Pistil -

2. Name the five stages or steps in plant germination.
   a.
   b.
   c.
   d.
   e.

3. What are the three requirements for good seed germination?
   a.
   b.
   c.

4. Name three factors that cause poor seed germination.
   a.
   b.
   c.

5. What three factors are required before photosynthesis can occur?
   a.
   b.
   c.

6. List three ways nutrients enter the plant.

   a.

   b.

   c.

7. Place an "X" beside each term below which is a means of pollen transfer.

   a. _____Temperature

   b. _____Wind

   c. _____Insects

   d. _____Photosynthesis

   e. _____Respiration

   f. _____Gravity

8. Name five methods of vegetative reproduction.

   a.

   b.

   c.

   d.

   e.

9. Write a short paragraph discussing the difference between photosynthesis and respiration.

10. List the steps of photosynthesis in relation to plant growth.

    a.

    b.

    c.

11. Name two functions of each plant part.

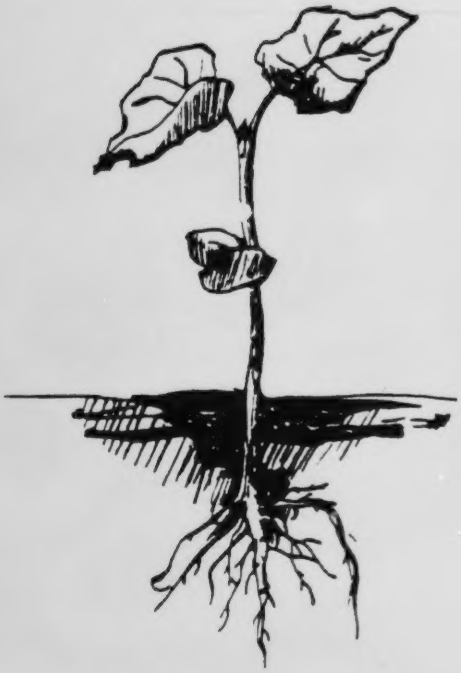
    a. Roots

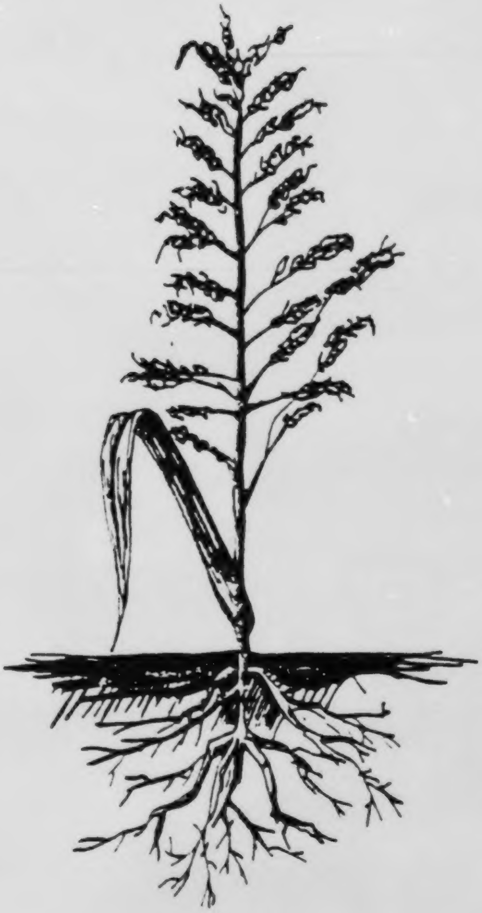
       1.

       2.

b. Stems
    1.
    2.
c. Buds or flowers
    1.
    2.
d. Leaves
    1.
    2.

12. Identify the two types of root systems.





a. ______________________________

b. ______________________________

13. Identify the parts of this flower.

a. ______________________

b. ______________________

c. ______________________

d. ______________________

e. ______________________

f. ______________________

g. ______________________

h. ______________________

i. ______________________

j. ______________________

k. ______________________

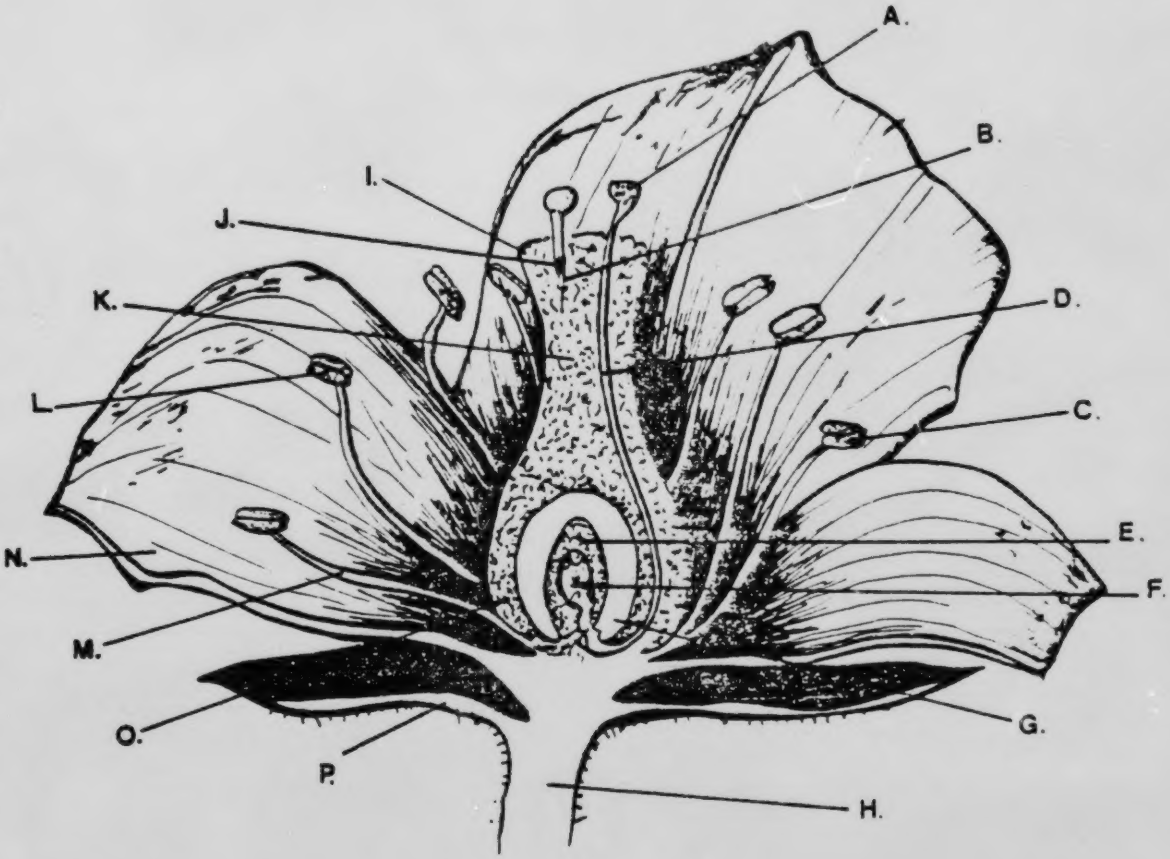
l. ______________________

m. ______________________

n. ______________________

o. ______________________

p. ______________________


A.
B.
I.
J.
K.
D.
L.
C.
E.
N.
F.
M.
O.
G.
P.
H.

14. Identify the parts of this stem.

a. ______________________________

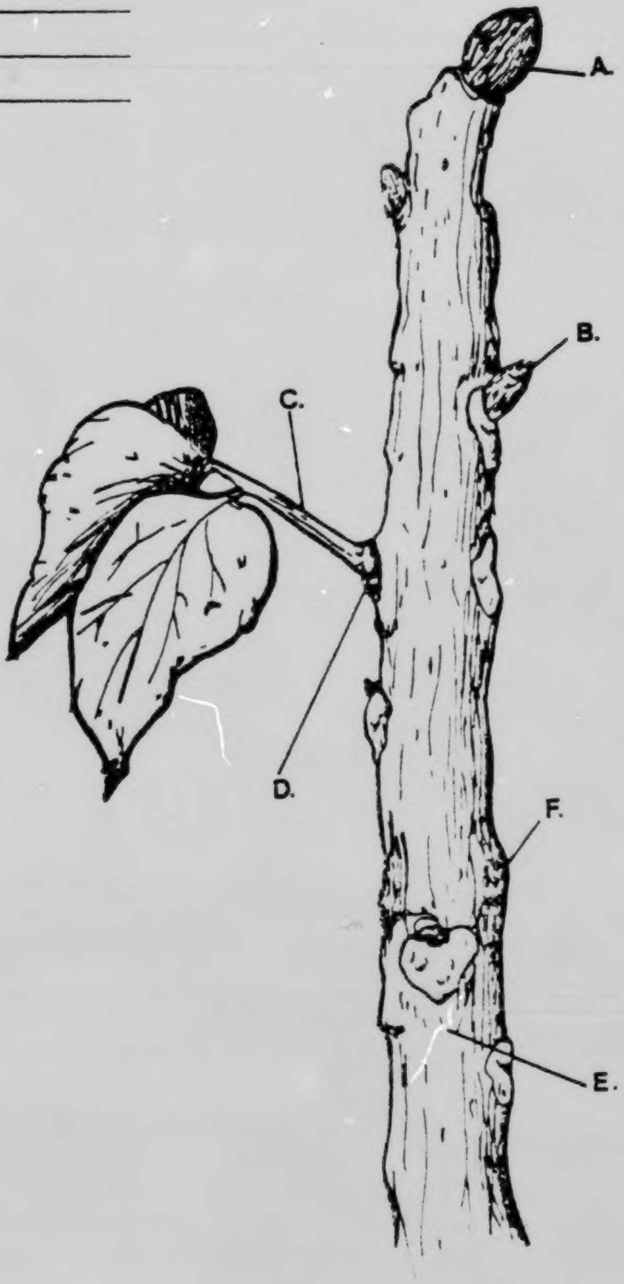
b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

f. ______________________________



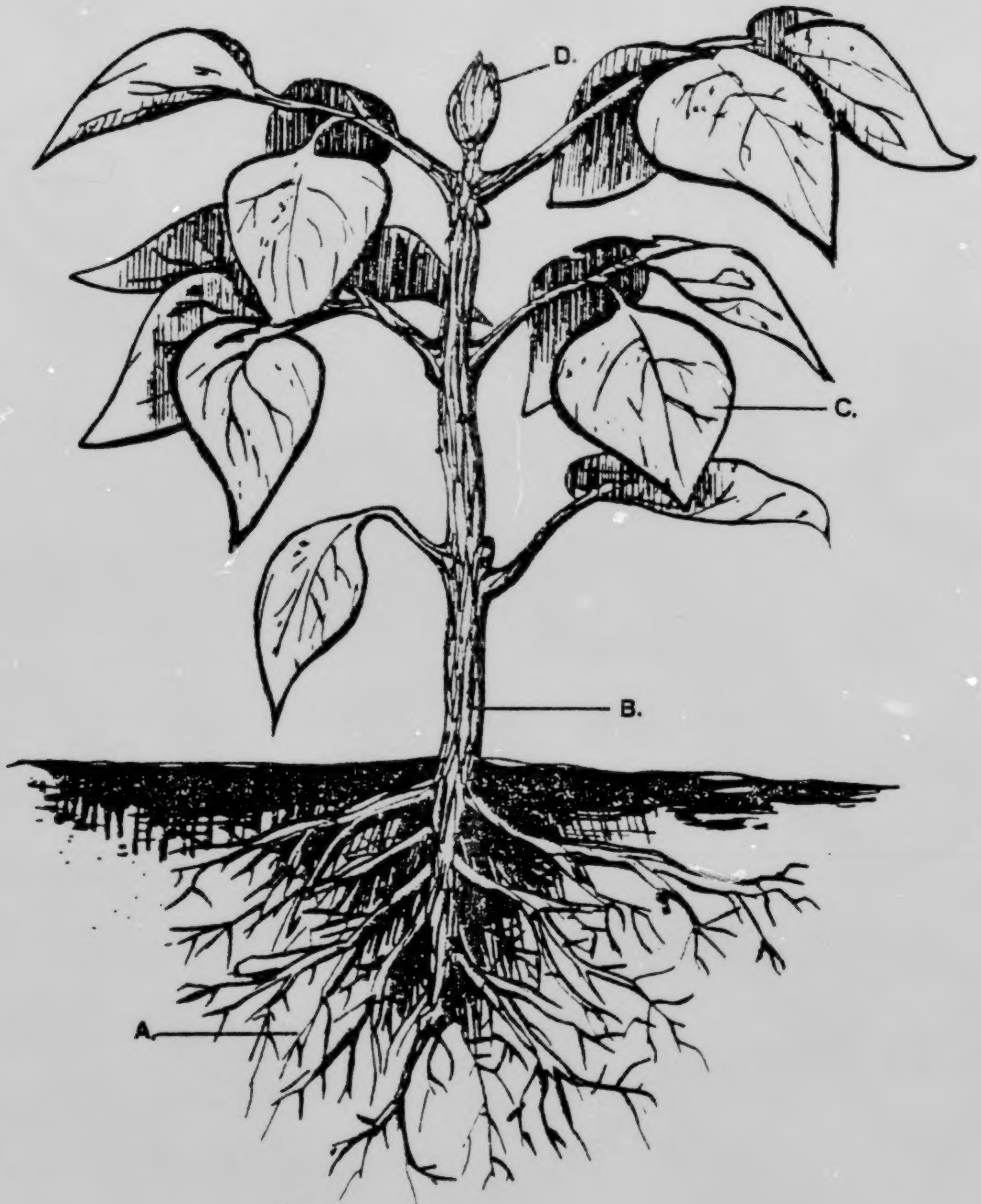
15. Identify the parts of this plant.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________



SEED SELECTION
UNIT IV

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to select good quality seeds. The student should be able to recognize noxious weeds and classify them as either primary or secondary. The student should adapt these skills to his or her home farm and community. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion, the student should be able to:

1. Write the definition of five terms associated with seed selection.
2. Name five factors to look for in selecting high quality seeds.
3. Identify ten noxious weeds.
4. Classify noxious weeds as primary or secondary.
5. List eight procedures to follow in handling and storing home grown seeds.
6. Name two methods of obtaining good seeds.
7. Name the six requirements that must be found on all Kansas seed labels.

SEED SELECTION
UNIT IV

INFORMATION SHEET

I. Terms and definitions

   A. Seed - A plant embryo and stored food materials surrounded by a seed coat

   B. Registered seed - The seed that is directly from the originator of a new variety or from previously registered seed and has been certified by a certifying agency to insure varietal identity and genetic purity

   C. Certified seed - The bulk of improved seed for sale for commercial growing that has been derived from the progency of foundation, registered, or certified seed and has been certified by a certifying agency to assure varietal identity and genetic purity

   D. Foundation seed - Seed stocks that are handled so as to assure varietal identity and most nearly maintain genetic purity and that have been certified by a certifying agency or agriculture experimental station

   E. Pure seed - The percentage of seed that will produce plants true to variety and type

   F. Inert matter - The percentage by weight of chaff, broken seeds, stems, and soil particles

   G. Hard seed - The seed which remains hard at the end of the prescribed test because it has not absorbed water, due to an impermeable seed coat

   H. Pure live seed - The amount of seed that when planted will produce plants

   I. Breeder seed - The seed used by the breeder to maintain the strain or variety

II. Factors to consider in selecting high quality seed

   A. Size and plumpness

   B. Color of seed coat

   C. Free of disease

   D. Free of broken seeds and noxious weeds

   E. Free of insects

III. Noxious weeds
   A. Prohibited (Transparency 1)
      1. Field Bindweed
      2. Hoary Cress
      3. Johnsongrass
      4. Russian Knapweed
      5. Musk Thistle
      6. Quackgrass
      7. Canada Thistle
      8. Texas Blueweed
      9. Burragweed
      10. Pignut
      11. Leafy Spurge
   B. Restricted (Transparency 2)
      1. Dodder
      2. Goatgrass
      3. Wild Onion or Garlic
      4. Downy Brome
      5. Curled Dock
      6. Morning Glory
      7. Silverleaf Nightshade
      8. Pennycress
      9. Wild Buckwheat
      10. Giant Foxtail
      11. Horse Nettle
      12. Cheat

IV. Handling and storing seeds
   A. Use certified seeds first planting
   B. Select clean-grown seed
   C. Control weeds
   D. Prevent seed from mixing
   E. Store in cool, dry place
   F. Treat seed for insects and disease control
   G. Test seed for germination
   H. Inspect seed during storage

V. Methods of securing good quality seeds
   A. Home grown
   B. Reliable seed dealers

VI. Requirements found on seed label (Transparency 3)
   A. Kind, variety, and origin
   B. Lot number
   C. Percentage of purity
   D. Percentage of inert matter
   E. Percentage of weed seed
   F. Percentage of other agricultural seeds

PROHIBITED NOXIOUS WEEDS

Field Bindweed	Pignut
Canada Thistle	Quackgrass
Johnsongrass	Texas Blueweed
Leafy Spurge	Russian Knapweed
Hoary Cress	Burragweed

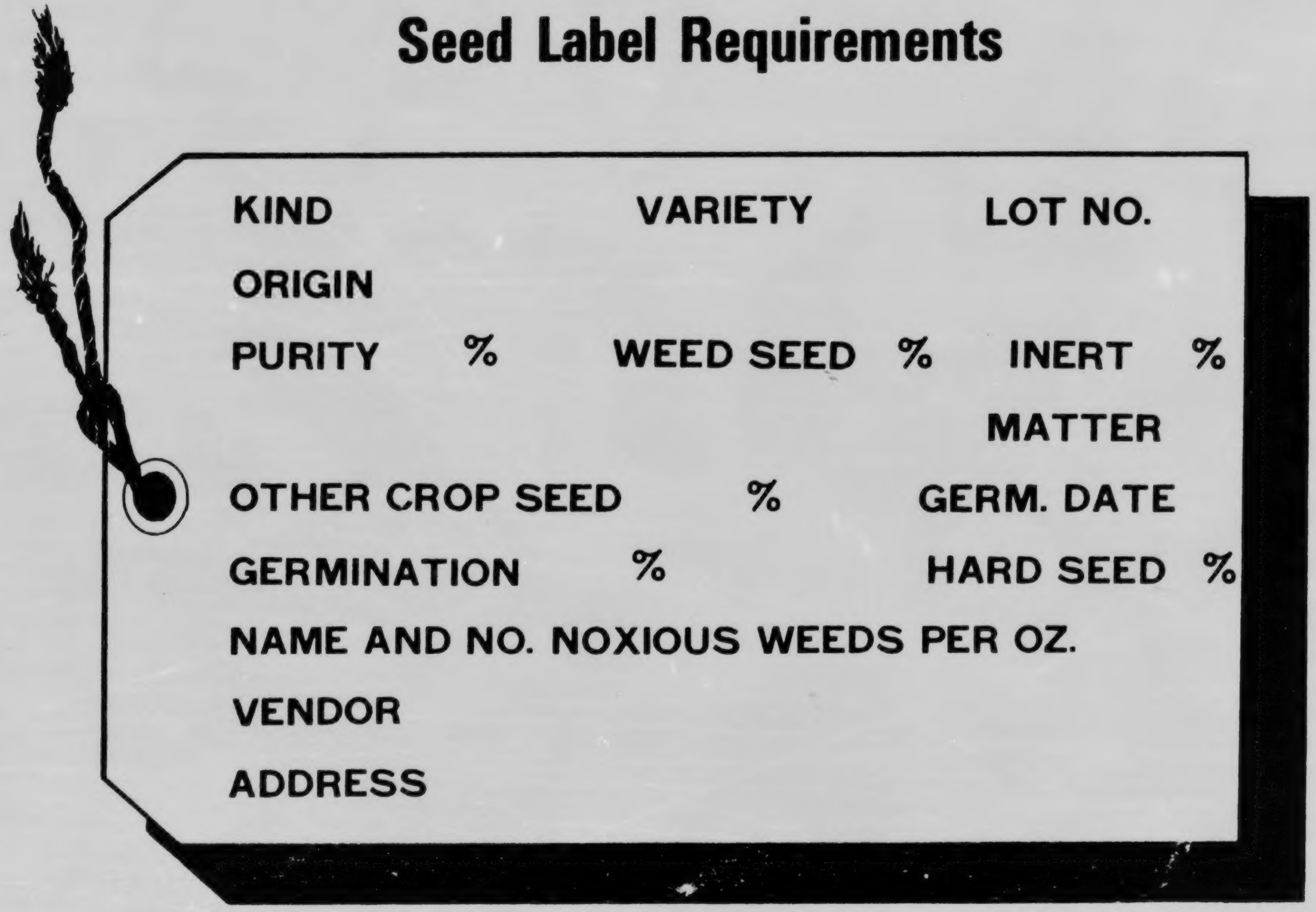
Musk Thistle

RESTRICTED NOXIOUS WEEDS

- Curled Dock
- Giant Foxtail
- Dodder
- Wild Buckwheat
- Downy Brome
- Cheat
- Silverleaf Nightshade
- Pennycress
- Horsenettle
- Morningglory
- Goatgrass
- Wild Onion or Garlic

Ag. II - 109-D

Seed Label Requirements



KIND VARIETY LOT NO.

ORIGIN

PURITY % WEED SEED % INERT MATTER %

OTHER CROP SEED % GERM. DATE

GERMINATION % HARD SEED %

NAME AND NO. NOXIOUS WEEDS PER OZ.

VENDOR

ADDRESS

SEED SELECTION
UNIT IV

ASSIGNMENT SHEET #1 - COLLECTING AND IDENTIFYING NOXIOUS WEEDS

Collect ten noxious weeds found in your local community and bring to class. List the weeds below and classify them as either primary (prohibited) or secondary (restricted) noxious weeds.

NAME	Primary (Prohibited)	Secondary (Restricted)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

SEED SELECTION
UNIT IV

TEST

1. Define the following terms:
   - a. Registered seed -
   - b. Foundation seed -
   - c. Breeder seed -
   - d. Seed
   - e. Pure seed -

2. List five factors to look for in selecting high quality seeds.
   - a.
   - b.
   - c.
   - d.
   - e.

3. Classify the following list of noxious weeds as either prohibited or restricted. Place number "1" in the blank indicating prohibited and number "2" indicating restricted.
   - a. _____Curled Dock
   - b. _____Wild Onion or Garlic
   - c. _____Dodder
   - d. _____Field Bindweed
   - e. _____Johnsongrass
   - f. _____Cheat
   - g. _____Canada Thistle
   - h. _____Pennycress
   - i. _____Pignut
   - j. _____Horsenettle
   - k. _____Silverleaf Nightshade
   - l. _____Burragweed
   - m. _____Leafy Spurge
   - n. _____Morning Glory
   - o. _____Hoary Cress
   - p. _____Russian Knapweed

4. Name eight procedures to follow in storing and handling home-grown seeds.
   - a.
   - b.
   - c.
   - d.

e.

f.

g.

h.

5. Name two methods of obtaining good quality seeds.

   a.

   b.

6. Name the six requirements that must be found on all Kansas seed labels.

   a.

   b.

   c.

   d.

   e.

   f.

LAND PREPARATION
UNIT V

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize different methods and benefits of seedbed preparation. The student should be able to recognize and identify various equipment used in land preparation. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define four terms associated with land preparation.
2. Name three basic reasons for tillage.
3. Name five characteristics of a good seedbed.
4. Name the factors that determine the time to "till."
5. List the advantages of fall tillage compared to spring tillage.
6. List four advantages of disposing of crop residue.
7. List two advantages of summer fallowing.
8. Write three advantages and three disadvantages of stubble mulching.
9. Recognize and identify equipment used in land preparation.
10. List two advantages of minimum tillage.
11. List three disadvantages of over-tillage.

LAND PREPARATION
UNIT V

INFORMATION SHEET

I. Terms and definitions

  A. Crop residue - The part of the crop that is left on the ground after harvesting

  B. Stubble mulching - The tillage beneath the stubble without covering all of the residue

  C. Humus - The decomposed plant residue

  D. Erosion - The removal of the topsoil by wind and water

  E. Tillage - Cultivation used to maintain a loose soil and eliminate weeds

  F. Pore space - Space between soil particles where soil, water, and nutrients are held

II. Reasons for tillage

  A. Eliminate weeds

  B. Increase soil's chemical and biological conditions for seed germination

  C. Improve physical condition of tight soils

III. Characteristics of a good seedbed

  A. Clean

  B. Firm

  C. Mellow

    1. First two or three inches

    2. Permits better air and water circulation

  D. Free of trash and weeds

  E. Free of disease

  F. Free of insects

IV. Factors determining time to till

  A. Type of crop

  B. Weed problems

- C. Erosion
  - 1. Wind
  - 2. Water
- D. Moisture

V. Advantages of "tillage"

- A. Advantages of fall "tillage"
  - 1. Increase time for crop residue to decay
  - 2. Reduce tillage load
  - 3. Improve chances of forming a firm seedbed
  - 4. Allow time for soil to crumble from freezing and thawing
  - 5. Aid in insect control
  - 6. Reduce work load in spring
- B. Advantages of spring "tillage"
  - 1. Aid in controlling wind erosion in sandy soil
  - 2. Add organic matter

VI. Advantages of turning crop residue to the soil

- A. Add organic matter to the soil
- B. Increase food elements
- C. Increase microorganism action
- D. Conserve moisture

VII. Advantages of summer fallowing

- A. Conserve moisture to increase yields
- B. Control weeds

VIII. Advantages and disadvantages of stubble mulching

- A. Advantages of stubble mulching
  - 1. Reduce erosion
  - 2. Increase moisture
  - 3. Increase crop yields

B. Disadvantages of stubble mulching
   1. Provides habitat for overwintering disease organisms
   2. Provides habitat for overwintering insects
   3. May require alterations in planting equipment and techniques

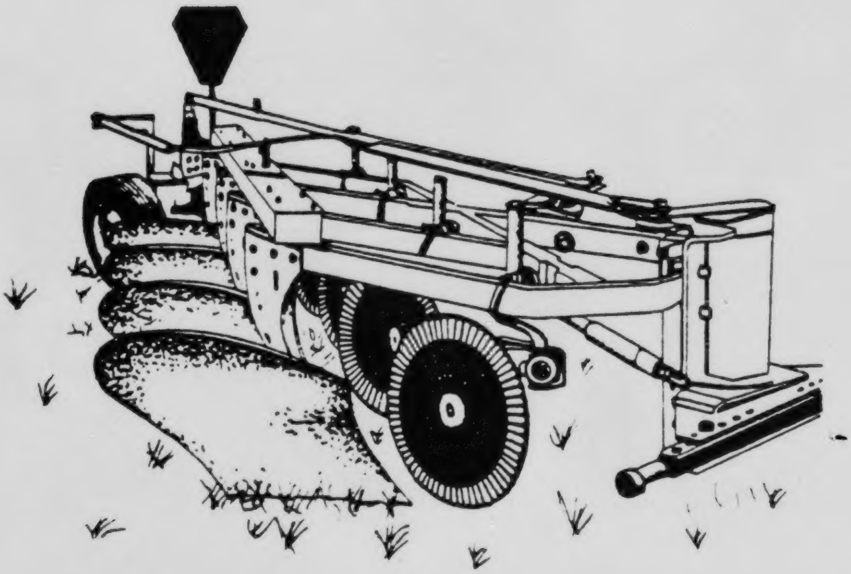
IX. Land preparation equipment (See Supplemental Information Sheet)
   A. Chisel plow
   B. Moldboard plow
   C. Spike tooth harrow
   D. Land roller
   E. String tooth harrow
   F. Tandem disk
   G. Disk plow
   H. Field cultivator

X. Advantages of minimum tillage
   A. Flexibility in planting date and soil moisture conditions
   B. Soil tilth is improved
   C. Water run-off and soil erosion is reduced
   D. Machinery, fuel energy, power and labor requirements are reduced

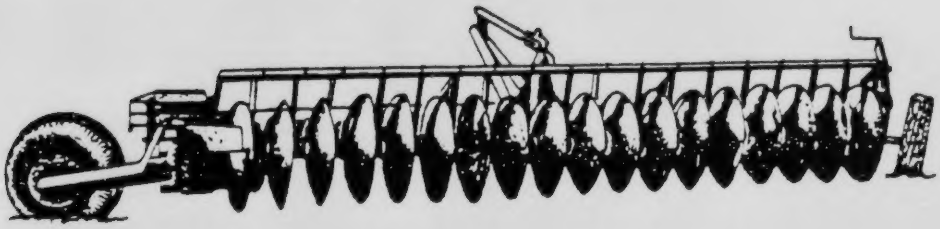
XI. Disadvantages of overtillage
   A. Moisture loss
   B. Increased soil erosion
   C. Crusting is increased
   D. Compaction of subsoil
   E. Assures germination of weed seeds
   F. Waste of machinery, labor, and fuel

SUPPLEMENTAL INFORMATION

Moldboard Plow

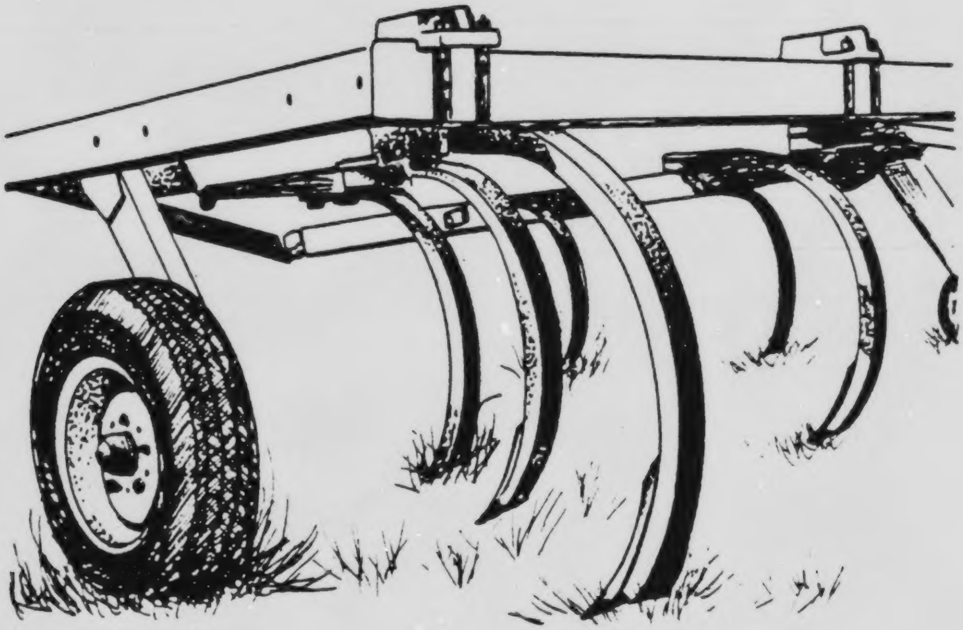


Disk Plow

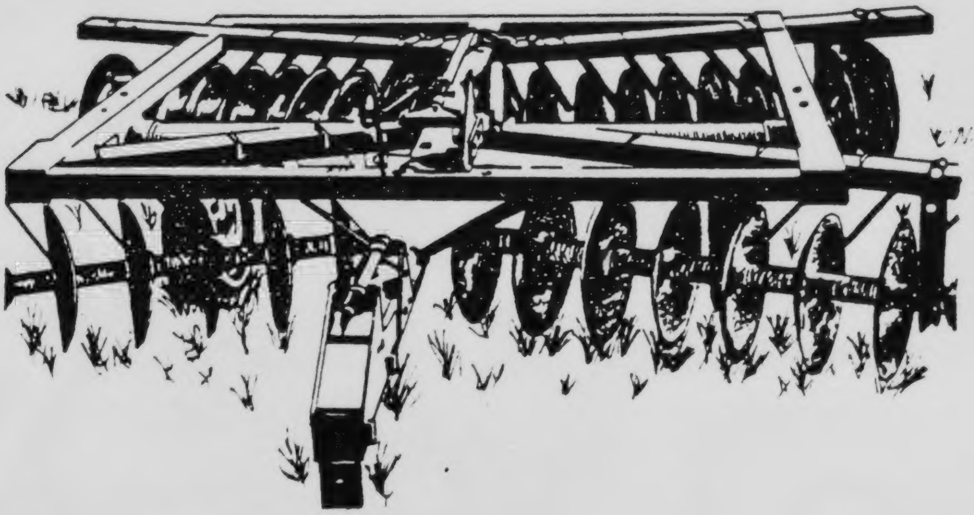


SUPPLEMENTAL INFORMATION

Chisel Plow

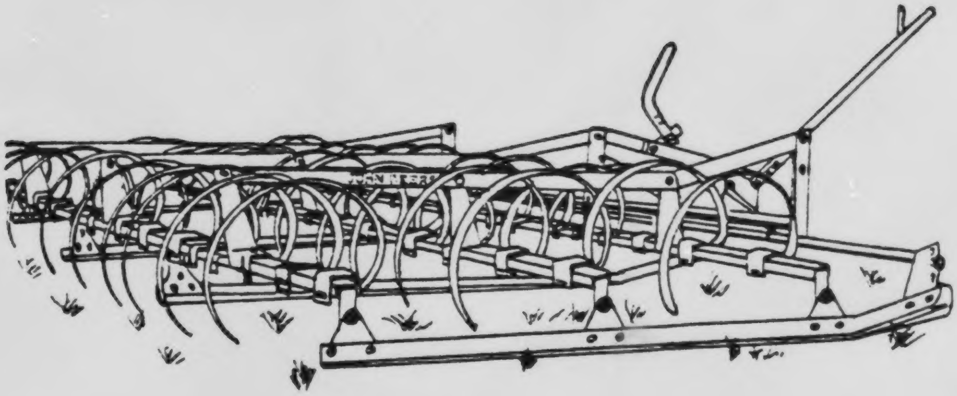


Tandem Disk

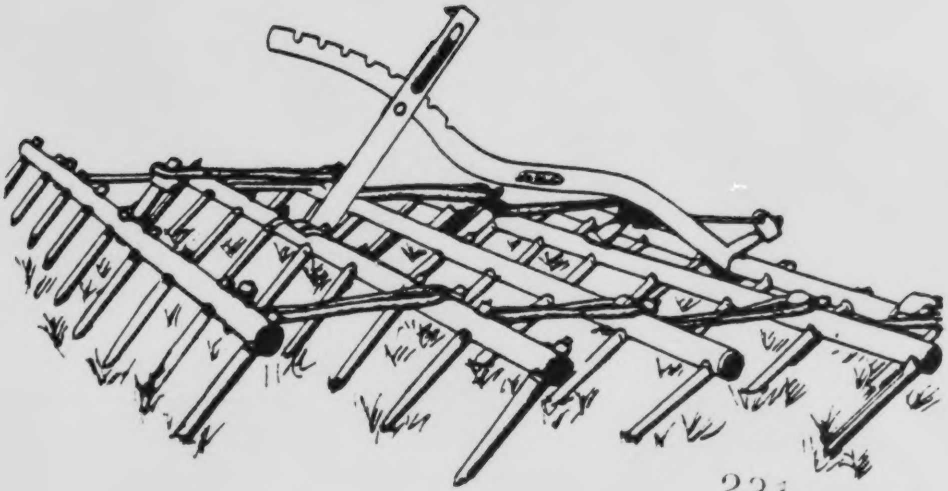


SUPPLEMENTAL INFORMATION

Spring Tooth Harrow

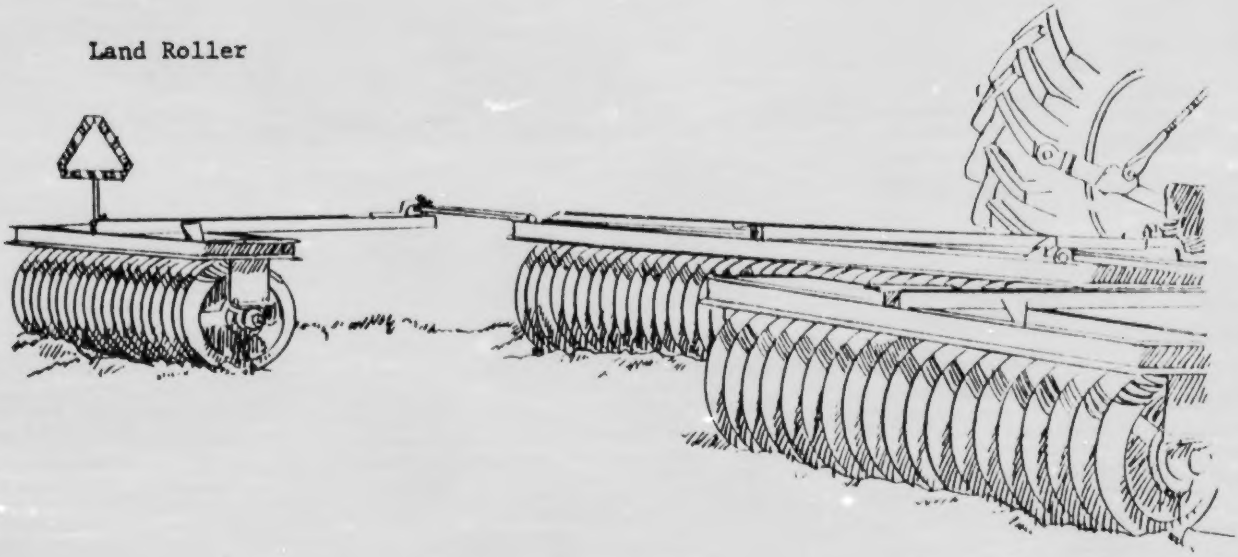


Spike Tooth Harrow

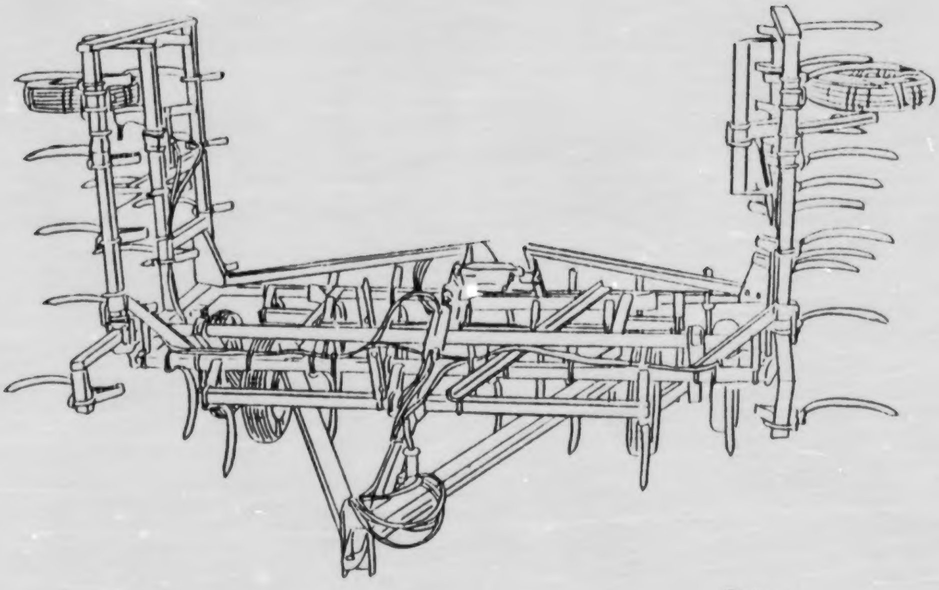


SUPPLEMENTAL INFORMATION

Land Roller



Field Cultivator



LAND PREPARATION
UNIT V

ASSIGNMENT SHEET #1--COLLECTING PICTURES OF LAND PREPARATION EQUIPMENT

Collect ten pictures of land preparation equipment of those types used in your local community, and explain how the equipment is used in tillage operation.

LAND PREPARATION
UNIT V

TEST

1. Define the following terms:
    a. Humus -
    b. Stubble mulching -
    c. Crop residue -
    d. Erosion -

2. What are the three basic reasons for tillage?
    a.
    b.
    c.

3. List five characteristics of a good seedbed.
    a.
    b.
    c.
    d.
    e.

4. Name the factors that help in determining the time to "till."
    a.
    b.
    c.
    d.

5. List two advantages of fall tillage as compared with spring tillage.
    a.
    b.

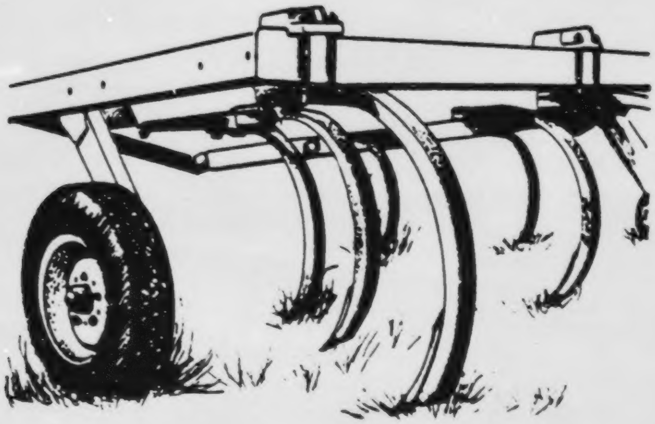
6. Name four advantages of returning crop residue to the soil.
   - a.
   - b.
   - c.
   - d.

7. What are two advantages of summer fallowing?
   - a.
   - b.

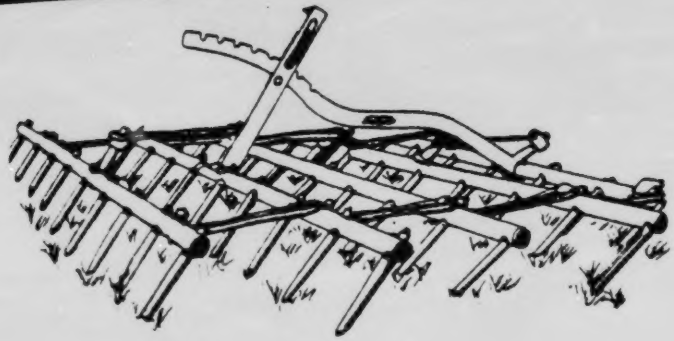
8. A. List three advantages of stubble mulching.
   1.
   2.
   3.

   B. What are two advantages of stubble mulching?
   1.
   2.

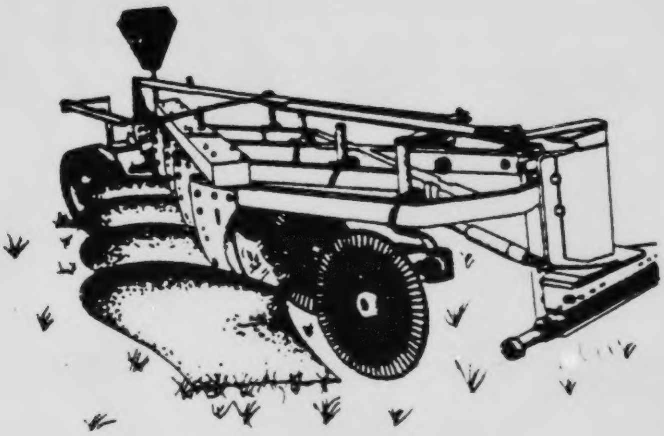
9. Identify the following tools used in land preparation.



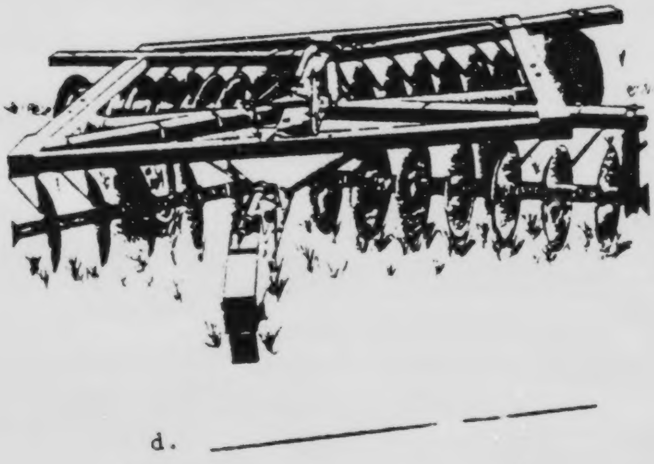
a. ______________________________



b. ____________________



c. ____________________



d. ____________________

10. Name two advantages of minimum tillage.

    a.

    b.

11. List three disadvantages of overtillage.

    a.

    b.

    c.

CHEMICAL WEED CONTROL
UNIT VI

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize the nature and extent of weed problems. The student should be able to discuss means of controlling weeds and adapt these practices to his/her home farm and community. The student should demonstrate this by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with chemical weed control.
2. List three ways weeds are propagated from area to area.
3. Detect agents that contribute to the spreading of weeds.
4. Recognize four factors with which weeds and crops compete.
5. List five ways that weeds can cause damage in a farming program.
6. Distinguish between the different methods of chemical treatments.
7. Discuss in writing three classifications of herbicides.
8. List the five herbicide formulations.
9. Name four factors that determine herbicide application rate.
10. Identify five herbicides and their respective crops on which they can be used.
11. Name three factors that determine when to apply herbicides.
12. Identify three styles of nozzles when given a drawing illustrating the styles.
13. List six safety precautions to follow when using herbicides.
14. Name two methods of properly disposing of empty herbicide containers.
15. Calculate a problem figuring the pounds of herbicide needed for an acre of land.
16. Calculate a problem figuring the amount of spray delivered per acre.
17. Collect and identify five weeds and discuss their means of reproducing.

CHEMICAL WEED CONTROL
UNIT VI

INFORMATION SHEET

I. Terms and definitions

   A. Weed - A plant out of place

   B. Chemical - A material that has been developed to control weeds without harming crops

   C. Herbicide - A chemical developed to control herbaceous plants

   D. Label - A legal identification attached to containers of any commercially sold agricultural chemical giving a summary of its properties, uses, and precautions

   E. Foliar herbicide - A herbicide applied to the crucial parts of a plant

   F. Soil herbicide - A herbicide applied directly to the soil

   G. Selective herbicide - A herbicide which kills or damages a select strain of plants

   H. Non-selective herbicide - A herbicide used to remove all or most of the plants within the treated area

   I. Penetration - The movement of the herbicide retained on the surface

   J. Translocation - The movement of a herbicide from the point of penetration to the other parts of the plant

   K. Retention - The amount of herbicide that remains on the foliage after application

   L. Perennial - The plants that normally live for more than two years

   M. Hazardous chemicals - The chemicals that are hazardous to man, animals, and plants

II. Ways by which weeds are propagated

   A. Seeds

   B. Roots

   C. Stems

III. Agents that spread weeds

   A. Wind

   B. Water

   C. Animals

   D. Man

   E. Equipment

IV. Factors for which weeds and crops compete
  A. Soil nutrients
  B. Moisture
  C. Light
  D. Carbon dioxide

V. Harmful effects of weeds
  A. Reduce crop yields
  B. Reduce quality of crop
  C. Increase production costs
  D. Increase labor and equipment costs
  E. Harbor diseases and insects
  F. Damage livestock and people

VI. Methods of application of chemical treatments (Transparency 1)
  A. Broadcast - Covers the entire area or field at a uniform rate
  B. Row or band - Places chemicals directly over the rows
  C. Spot - Places chemicals in limited areas infested with weeds
  D. Directed sprays - Places spray directly on a certain part of the plant

VII. A. Preplant - Applying herbicides before the crop is planted
  B. Preemergence - Applying chemicals before the crop or weeds emerge
  C. Postemergence - Applying chemicals after the crops or weeds emerge

VIII. Herbicide Formulations
  A. Water-soluble concentrates
    1. Readily dissolve in water
    2. No further agitation required once dissolved
  B. Emulsifiable concentrates
    1. Readily mix with water
    2. Mild agitation may be required to maintain emulsion
  C. Flowables
    1. Finely ground solids or semi-solids put into a liquid that make the mixture form a suspension

D. Wettable powders

1. Insoluble or only slightly soluble in water or oil

2. Particles must be kept in suspension by mechanical or jet agitation during spraying operation

E. Granules and pellets

1. Can be formulated with most herbicides

2. Difficult to apply at low rates

IX. Factors determining herbicide application rate

A. Texture of soil

B. Organic matter of soil

C. Size and condition of crops

D. Size and condition of weeds

E. Available moisture

F. Height of sprayboom

X. Recommended herbicides for crops

A. Corn - Atrazine (AAtrex) for broad leaf weeds, Alachlor (Lasso) - controls grass

B. Sorghum - Propachlor (Ramrod 65 wp or Ramrod 206) - effective for grass control, Propazine (Milograd) and Terbutryn (Igram) - for a combination control of weeds and grass

C. Soybeans - Trifluralin (Treflan) - control of grass, Chloramben, (Amiben) - controls grass and some broadleaf, Oryzalin (Surflan) - controls some broadleaf weeds

D. Pasture and Range - Weeds - 2, 4-D, Woody Plants - 2,4,5,T, Round-up

(NOTE: As new products are developed quite often and regulations allowances, use of chemicals change, check these recommendations with dealers in your community.)

XI. Factors determining application rate of herbicides

A. Climate

1. Temperature

2. Wind

3. Moisture

B. State of plant growth

C. Condition of plant

XII. Common Styles of Nozzles (Transparency 3)

- A. Hollow and solid cone
- B. Flooding flat
- C. Regular flat fan
- D. Chart illustrating nozzle styles

NOZZLE STYLES

Type	Suggested Use	Recommended Pressure (Pounds Per Square Inch)	Types of Spray Pattern
Solid and hollow cone	Insecticides and fungicides (foliar applications)	60 and above	Circular fan type pattern giving good penetration of sprayed surface
Flooding flat	Preemergence postemergence herbicides where drift is hazardous	5-20 for maximum drift control; never exceed 40	Coarse fan type pattern. Sprays wide surface, yet can be close to sprayed surface
Flat Fan	Weed and brush control	10-30; never over 40	Reasonably coarse spray in a fan type pattern that will overlap along a spray boom

XIII. Safety precautions

- A. Follow Government recommendations
- B. Use according to label instructions
- C. Use herbicides only on recommended crops
- D. Wear protective clothing
- E. Guard against injury to other plants
- F. Dispose of containers properly

XIV. Disposal of empty containers

A. Bury glass and metal containers

B. Burn paper containers

(NOTE: Proper disposal prevents toxic contamination of animals, plants, and humans.)

XV. Calculation of pounds of herbicide needed per acre

A. Formula calculation

1. $$\frac{\text{lbs. per acre by 100\%}}{\text{strength of mixture}} = \text{lbs. of product required per acre}$$

B. Examples

1. $$\frac{\text{6 lbs. per acre active ingredient by 100\%}}{\text{50\% strength of mixture}} = \text{12 lbs. of product required per acre}$$

2. $$\frac{\text{4 lbs. per acre active ingredient}}{\text{4 lbs. per gallon product}} = \text{1 gallon of product required}$$

(NOTE: The product label states the amount of active ingredients by percent by weight or pounds equivalent per gallon of liquid.)

XVI. Calibration of amount of spray delivered per acre

(NOTE: Accurate application is always important. The proper amount of herbicide applied uniformly, will give the best results. Careful calibration assures that the herbicide will be applied at the proper rate and in the recommended amount of water, evenly over the entire field.)

A. 100-foot method at 40-inch row spacing.

(NOTE: For other row spacings, change the measured distances. Instead of timing 100 feet, use the following distances:

Row spacing (inches)	36	32	28	24	20
Distance to time (feet)	113	128	146	170	200

1. Measure off 100 feet in the field to be sprayed. Clock the number of seconds it takes to spray rig to cover this distance in the gear and at the throttle setting selected for spraying Make several runs over the distance and average the time it takes. Mark the throttle setting.

2. With the rig standing still, engage the power take-off and set the throttle at spraying position. Set sprayer pressure at 30 pounds per square inch. Catch the output from several nozzles for the number of seconds it took to cover 100 feet in step 1. Determine the average output per nozzle in ounces.

3. Using 1 nozzle per row, the output in ounces per nozzle equals the gallons of spray mix that will be delivered per acre. Using 2 nozzels per row (nozzles on 20 inch centers on boom) multiply the average nozzle output by 2 to get the gallons applied per acre. Using 3 nozzles per row, multiply the average nozzle output by 3.

4. Divide, the capacity of your tank by the gallons applied per acre, as determined in Step 3, to find the number of acre, you can treat per tank of spray.

5. To determine how much herbicide to add to the tank, multiply the rate per acres recommended for your conditions by the number of acres your tank will cover, as determined in Step 4.

   (NOTE: There are many methods of calibrating a sprayer. The one described above is accurate and fairly simple.)

B. Example:

1. A sprayer travels 100 feet in an average of 15 seconds when the pressure gauge is set at 30 p.s.i. With the sprayer standing still, and the tractor in neutral and running at the selected throttle setting, the nozzles averaged 10 ounces output per nozzle in 15 seconds. Therefore, if one nozzle **is** used per 40 inch row, the sprayer will deliver 10 gallons per acre. If two nozzles are used per 40-inch row, the sprayer will deliver 20 gallons per acre.

C. Nozzle calibration by calculation

1. Measure off 200 feet. (NOTE: Drive the sprayer over this distance and determine the time required to travel this distance at the selected throttle setting. Make two or more runs and determine the average time required.)

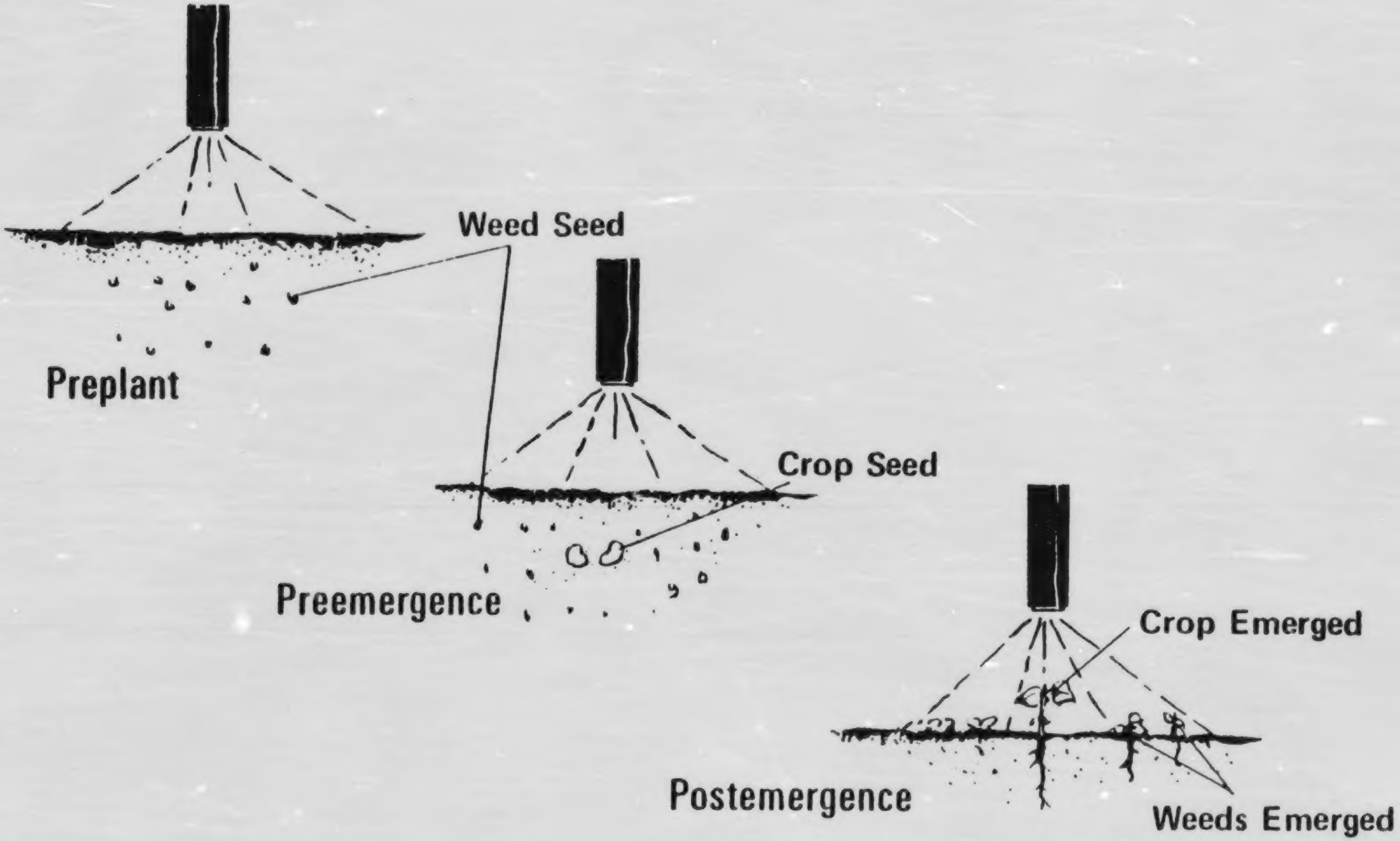
2. Place tractor in neutral gear.

3. Set throttle at spraying position. (NOTE: Take a kitchen measuring cup and catch the spray output from one nozzle for the same length of time as required for the sprayer to travel 200 feet. Repeat for several nozzles and calculate the average output in ounces per nozzle.)

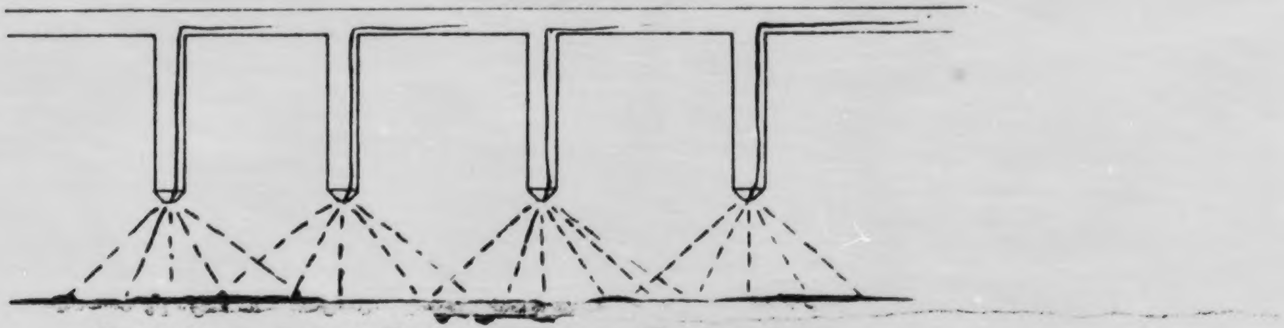
4. Multiply answer by 66. (NOTE: This gives the number of ounces applied per nozzle per acre.)

5. Divide by 128. (NOTE: This gives number of gallons per acre. Answer will be number of gallons spray will apply per acre using one nozzle per row spaced 40 inches apart on the boom. If using two nozzles per row, nultiply answer by two; if using three nozzles per row, multiply answer by three.)

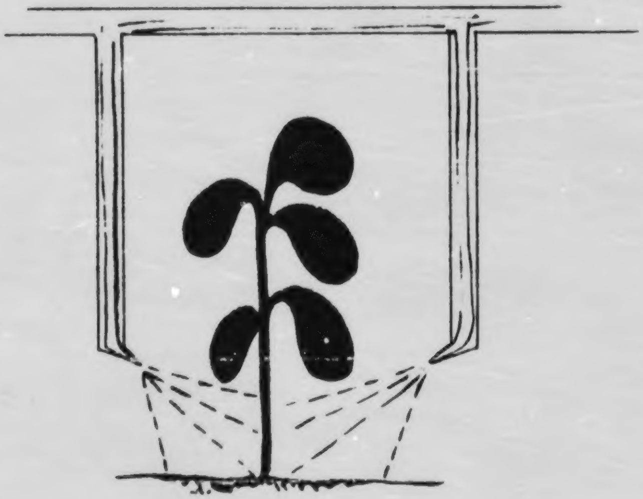
HERBICIDE CLASSIFICATIONS


Weed Seed
Preplant
Crop Seed
Preemergence
Crop Emerged
Postemergence
Weeds Emerged

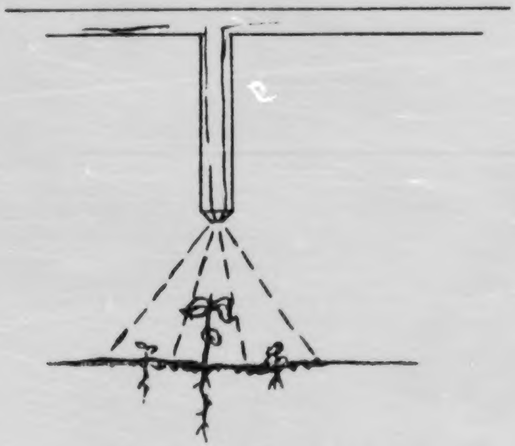
Application of Herbicides



Broadcast Spray Pattern Covers Entire Area



Directed Spray Beneath Plant Leaves

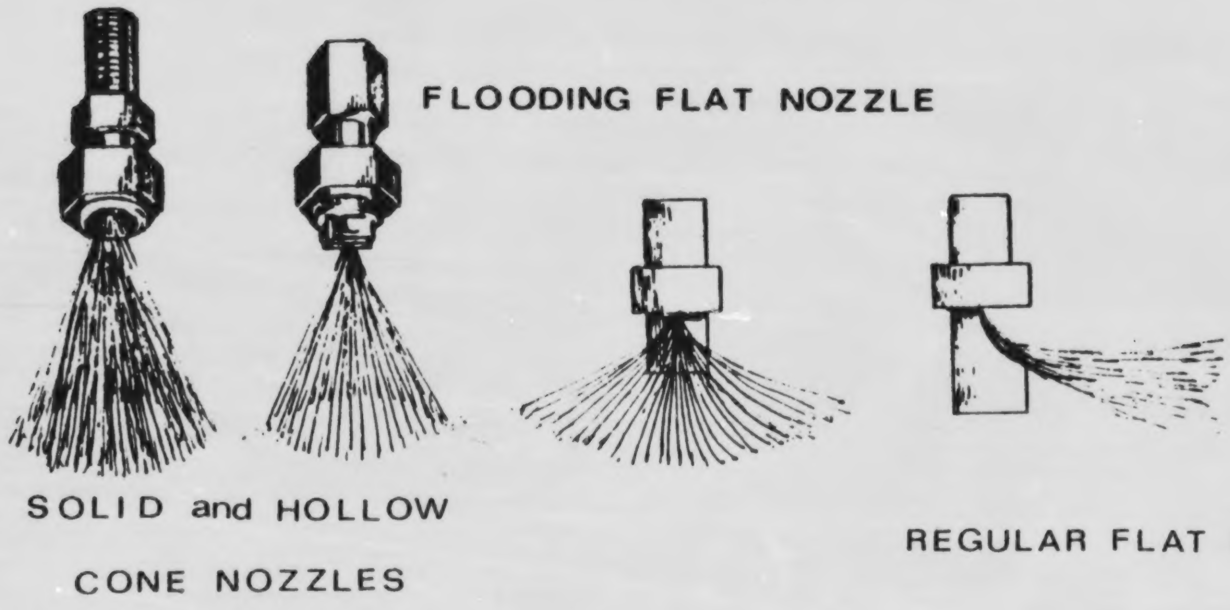


Band Spray Pattern
Over the Row

TM 2

Ag. II - 155-D

NOZZLE STYLES


FLOODING FLAT NOZZLE
SOLID and HOLLOW CONE NOZZLES
REGULAR FLAT FAN NOZZLE

CHEMICAL WEED CONTROL
UNIT VI

ASSIGNMENT SHEET #1--WEED IDENTIFICATION

Complete the following form. Collect and identify the problem weeds found on your farm and check the way or ways in which they spread.

NAME OF WEED	RHIZOMES	ROOTSTOCK	SEED	STEM

CHEMICAL WEED CONTROL
UNIT VI

ASSIGNMENT SHEET #2--CALCULATING APPLICATION RATES OF HERBICIDES

Work the following problems and show your work.

1. A manufacturer recommends four pounds of a 50% wettable powder for spraying corn. How many pounds of this product would be required to spray a required acre?

2. A manufacturer recommends four pounds of an 80% wettable powder for spraying corn. How many pounds of this product would be required to spray a required acre?

3. A sprayer travels 100 feet within an average of 30 seconds. The pressure gauge indicates the unit will operate at 45 pounds pressure. Sprayer will put out ten ounces per nozzle in 30 seconds while in neutral position at 45 pounds pressure. How much spray will this sprayer deliver per acre when using nozzles per row?

CHEMICAL WEED CONTROL
UNIT VI

TEST

1. Define the following terms:
    a. Herbicides -
    b. Label -
    c. Perennial -
    d. Weed -
    e. Soil herbicides -

2. Name three ways weeds are propagated from one area to another.
    a.
    b.
    c.

3. Name four agents that contribute to the spreading of weeds.
    a.
    b.
    c.
    d.

4. List four factors with which weeds and crops compete.
    a.
    b.
    c.
    d.

5. Name five harmful effects of weeds
    a.
    b.
    c.
    d.
    e.

6. Match the methods of chemical treatments on the left with the appropriate statement on the right.

   a. Row or bank
   b. Direct spray
   c. Broadcast
   e. Spot

   _____1. Placing chemicals over the entire area at a uniform rate
   _____2. Placing chemicals directly over the rows
   _____3. Placing chemicals in limited areas infected with weeds
   _____4. Placing chemicals directly on a certain plant.

7. Identify the following terms:

   a. Preplant -

   b. Preemergence -

   c. Postemergence -

8. What are the five forms of herbicides?

   a.
   b.
   c.
   d.
   e.

9. What four factors determine the herbicide application rate?

   a.

   b.

   c.

   d.

10. List for each herbicide, the respective crop on which it should be used.

Herbicide	Crop
a. Propachlor	a.
b. Trifluralin	b.
c. 2,4-D	c.
d. Atrazine	d.
e. Propazine, Terbutryn	e.

11. Name three factors determining when to apply herbicides.

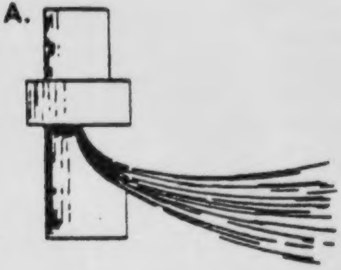
a.

b.

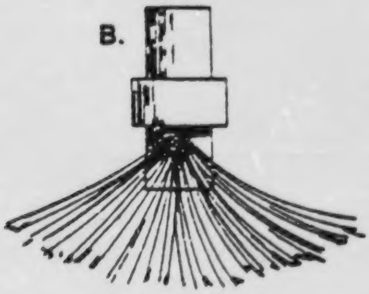
c.

12. Identify the following types of nozzles.

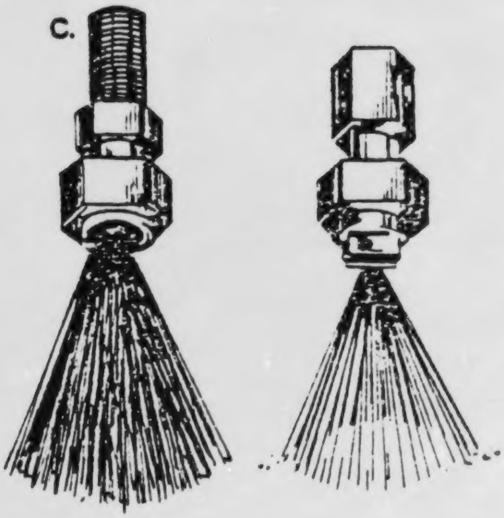
A.



B.



C.



a. ______________________________

b. ______________________________

c. ______________________________

13. Name six safety precautions to follow when applying herbicides.

a.

b.

c.

d.

e.

f.

14. Name two methods of properly disposing of empty herbicide containers.

15. How many pounds of 50% wettable powder will it take to spray a given acre of land? (The manufacturer recommended four pounds.)

16. How many gallons of spray are delivered per acre if a sprayer travels 200 feet in annaverage of 25 seconds with the pressure gauge indicating 50 pounds of pressure? (The nozzels averaged 12 ounces output per nozzle in 25 seconds.

PLANT INSECT CONTROL
UNIT VII

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize plant damage caused by insects and be able to develop a plan for controlling insects. He should be able to collect and identify common insects on his home farm. This knowledge will be evidenced by the scoring of eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match five terms associated with plant insects.
2. Name five factors used in controlling insects.
3. Classify insects according to the way they feed on plants.
4. Classify insects as either harmful or beneficial.
5. Recognize the importance of economics in relationship to plant insect control.
6. Label a drawing showing the life cycles of most insects of economic importance.
7. Classify insecticides as either stomach poisons, contact poisons, or fumigant poisons.
8. Distinguish between natural and artificial control of insects.
9. Recognize 2 types of plant damage and identify the insect or insects causing the damage.
10. Collect and identify five harmful insects telling method of control and crops they attack.
11. Construct a chart when given the name of the insect giving adult description, damage, and crops attacked.

PLANT INSECT CONTROL
UNIT VII

INFORMATION SHEET

I. Terms and definitions

A. Insect - Any small, boneless animal whose body is divided into three sections and has six legs

B. Insecticide - A chemical used to kill insects

C. Life cycle - The stages in the life development of insects

D. Pesticide - A poisonous chemical used to control pests

E. Nymph - A young insect which looks much like a small adult insect

II. Factors used to control insects

A. Tillage, pasturing, and planting

B. Rotation and selection of crops

C. Planting dates

D. Destruction of trash

E. Quarantine areas

F. Biological control

G. Poison baits

H. Chemical control

III. Insect classification (According to plant feeding)

A. Chewing - This group bites off, chews, and swallows plant parts

1. Armyworms
2. Grasshoppers
3. Cutworms
4. Weevils
5. Flea beetles
6. Southwestern corn borer

B. Sucking - This group pierces the outer layer of the plant and feeds from the cells

1. Aphids
2. Mites
3. Chinch bugs
4. Hessian flies

5. Greenbugs

C. Internal feeding - Enters the plant and feeds from within

1. European corn borer

D. Subterranean - This group includes both chewing and sucking insects which enter the plant below the soil surface

1. Corn rootworm

IV. Insect classification (According to benefit or harm)

A. Beneficial insects (Transparency 1)

1. Ground beetle - Feeds on insects

2. Lady beetle - Feeds on aphids

3. Lacewing larva - Feeds on aphids

B. Harmful insects classified as to crop attacked.

Crop Attacked	Insects	Adult Description	Larvae Description	Damage	Control*
Alfalfa	Alfalfa Weevil	Snout beetle, 3/16" long, brown to black with faint lighter markings	Caterpillar, 3/8" long, brown head, green body, white stripe down back	Adults and larvae feed on growing tips, leaves, and buds	Liquid foliage application
	Pea Aphid	3/16" long, light to deep green, red eyes	Nymph, look like small adult	Pierces leaves, stems, blossoms, and pods and sucks sap	Liquid foliage application
	Spotted Alfalfa Aphid	1/16" long, pale yellow, rows of black spots on their backs, females - wingless	Nymph, look like small wingless adult, brighter in color	Suck juice from leaves and stems	Liquid foliage application or planting time soil treatment
	Variegated Cutworm	Moth, dark fore wings, lighter hind wings	Caterpillar, 2" long, 4 or 5 white dots down back of dark body	Suck nectar from flowers	Surface treatment of soil or leaves
Corn	Corn Rootworm	1/4" long, pale or yellowish green	Soft-bodied, white larvae 1/2" long	Larvae feeds on roots, adults eat foliage and silk	Granular soil treatment at planting time
	European Corn Borer	Moth, buff colored with dark brown wavy bands on wings, 1" wing spread	Caterpillar, pink-grey with random spots	Chews leaves, then all parts of stalks and ears	Foliage application

*Because of variability in federal regulations regarding insecticides, use of insecticides is subject to change. Check with the latest copy of "Kansas Field Crop Insect Control Recommendations", Cooperative Extension Service, for the recommended insecticide use.

Crop Attacked	Insects	Adult Description	Larvae Description	Damage	Control
Corn (con't)	South-western Corn Borer	Moth, white to smoky yellow, 1 1/4" wing spread	Yellowish caterpillar with dark spots, 1" long	Eats leaves, then bores into stalk	No recommended chemical control, early planting for early harvest
	Spider Mite	Varies according to species	Nymph, look like small adult	Infest leaves, suck sap	Liquid foliage application
	Western Bean Cutworm	Moth, dark, light bar across front of wing, bean shaped marks at tips of wings	Caterpillar, tan, dark shield behind head 1 1/2" long	Cuts plants off near ground	Liquid foliage application
Sorghum	Chinch Bug	Soft-bodied, black with white wings with spots on them, 1/5" long	Nymph, brick red wings reduced to small pads until adult stage is reached	Sucks juices from plants	Apply to the soil as they migrate from small grains to row crops
	Corn leaf Aphid	Greenish-blue with dark heads	Nymph, look like small adult	Suck plant juices, can transmit diseases	Chemicals generally not recommended, may use liquid foliage application

Crop Attacked	Insects	Adult Description	Larvae Description	Damage	Control
Wheat	Armyworm	Moth, brownish-gray, 1 1/2" wing spread	Caterpillar, greenish, 3 stripes on side, 1 1/2" long	Eats foliage, strips field	Foliage application
	Fall Armyworm	Moth, gray-, white-, or dull-colored, 1 1/4" wing spread	Caterpillar, green to black with inverted white "y" on head, 1 1/2" long	Eats foliage, often completely destroys crop	Soil surface plus foliage application
	Army Cutworm	Moth, dark fore wings, lighter hind wings	Caterpillar, dark green or brown, 1 1/2" long	Cuts plants off near ground	Soil or liquid foliage application
	Brown Wheat Mite	Tiny brown mite, first 6-legged, then 8	Nymph, looks like small adult	Sucks sap from plant	Soil or liquid foliage application
	Flea Beetle	1/16" long, shiny, jumping, dark	Caterpillar, slender, white	Chew small holes in leaves	Soil or liquid foliage application

Crop Attacked	Insects	Adult Description	Larvae Description	Damage	Control
Wheat (con't.)	Hessian fly	Mosquito-like fly, dark-bodied, 1/10" long	Small red maggot, 1/16" long	Sucks juices from plants	No recommended chemical control, delay seeding until flies have emerged
	Pale Western Cutworm	Moth, lighter hind wings, dark fore wings	Caterpillar, transparent looking, 1 1/2" long	Cuts plants off near ground	Surface application, light tillage
Miscellaneous					
Corn, Small Grains	Grasshopper	Varies according to species	Nymph, looks like small adult	Eats foliage, stripping plants	Varies according to crop
Sorghum, Wheat	Greenbug	Yellowish-green aphid, dark green stripe down back	Nymph, looks like small adult	Sucks sap, weakening and killing plants	Sorghum: planting time application with systemic insecticide or foliage application Wheat: foliage application

V. Economic factors of plant insect control
  A. Takes one billion a year
  B. Over $4 billion annual loss
  C. Damages 10% to 15% total crops

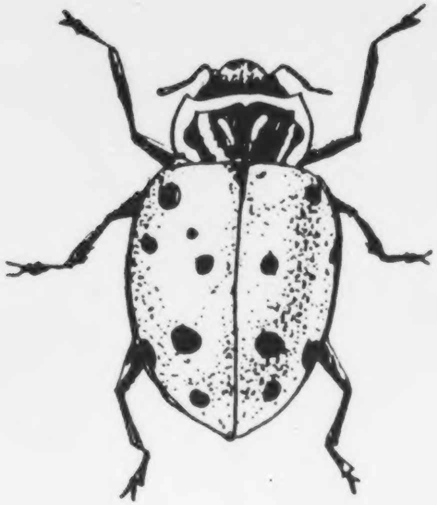
VI. Life cycles (Transparencies 2 and 3)
  A. Four-stage group
  B. Three-stage group

VII. Insecticide classification
  A. Fumigant poisons - Enter the insect's body through the tracheal system in the form of a gas
  B. Stomach poisons - Eaten and digested by the insect
  C. Contact poisons - Absorbed through the insect's skin or body wall and act on the pest's nervous system

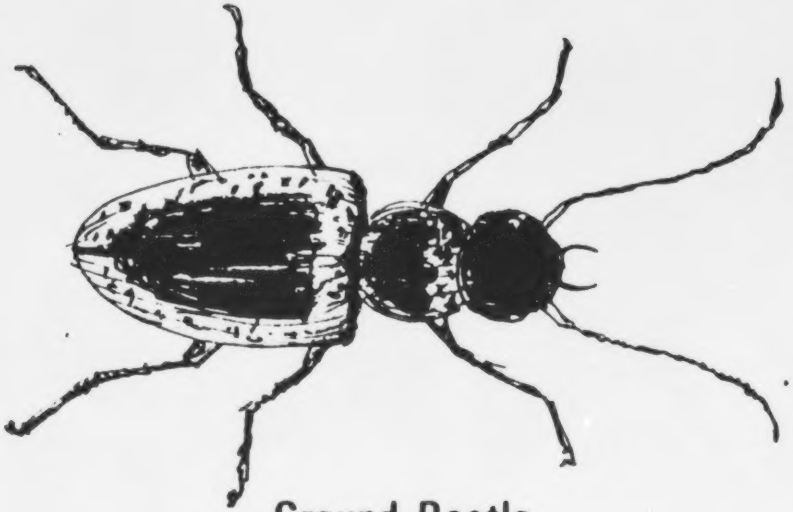
VIII. Methods of insect control
  A. Natural
    1. Climate
    2. Temperature
    3. Rainfall
    4. Sunshine
    5. Predatory insects
    6. Parasites
    7. Diseases
  B. Artificial
    1. Mechanical
      a. Insect traps
      b. Colored lights
      c. Electric grids
    2. Cultural
      a. Rotation of crops
      b. Tillage
      c. Planting dates
      d. Drainage
      e. Resistant plant varieties

3. Biological
    a. Predatory insects
    b. Parasites
    c. Diseases
    d. Male sterile insects
4. Chemical

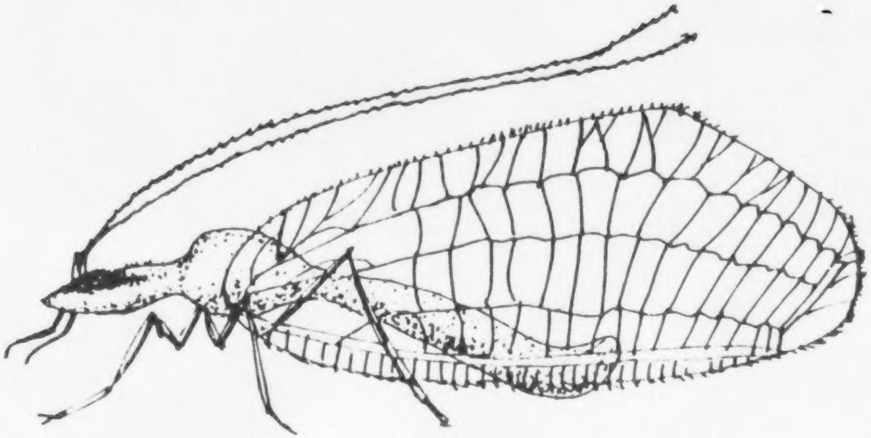
Beneficial Insects



Lady Beetle

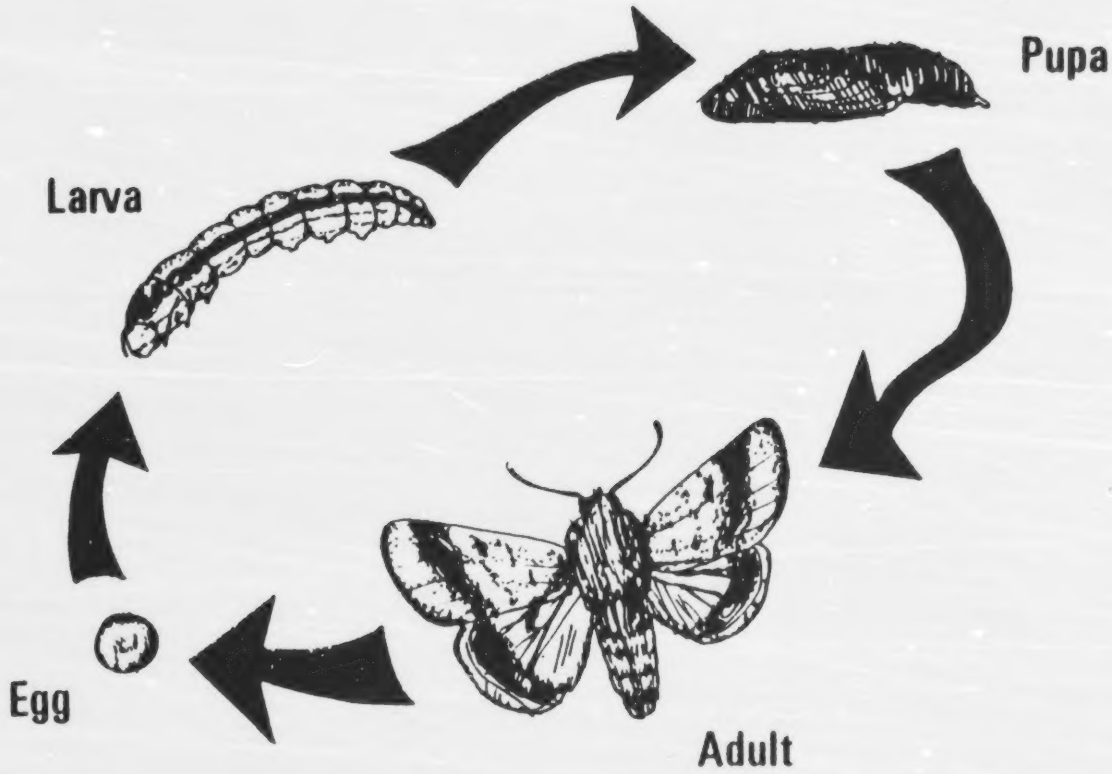


Ground Beetle



Lacewing

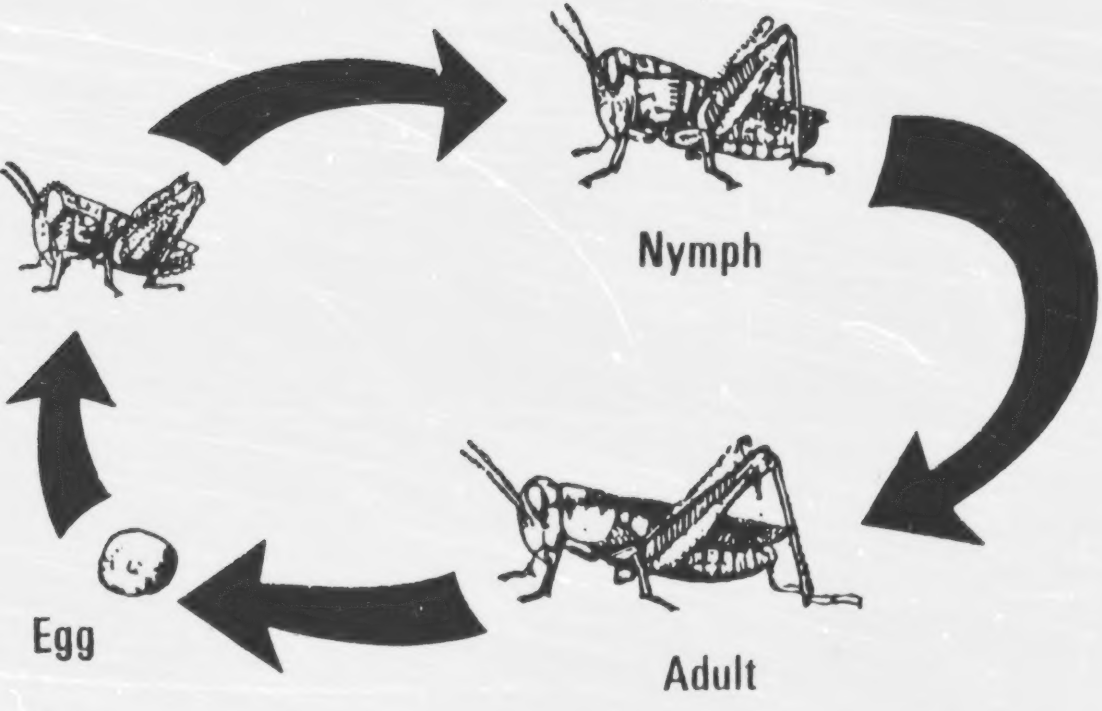
Life Cycle of Insects


Pupa
Larva
Egg
Adult

Ag. II - 187-D

TM 2

Life Cycle of Insects


Nymph
Adult
Egg

Ag. II - 189-D

PLANT INSECT CONTROL
UNIT VII

ASSIGNMENT SHEET #1--COLLECTING AND IDENTIFYING INSECTS

Survey your local community and collect five specimens of insects. List the insects on the chart below and indicate their method of feeding and the crops they attack.

INSECT	METHODS OF FEEDING		CROP ATTACKED
	SUCKING	CHEWING	
1.			
2.			
3.			
4.			
5.			

PLANT INSECT CONTROL
UNIT VII

TEST

1. Match the words with the correct definition

_____a. The stages in the life development of insects

_____b. A young insect which looks much like a small adult insect

_____c. A poisonous chemical that is used to control pests

_____d. A chemical used to kill insects

_____e. Any small boneless animal whose body is divided into three sectional and has six legs

1. Nymph
2. Insect
3. Life cycle
4. Insecticide
5. Pesticide

2. Name five factors used in controlling insects.

a.

b.

c.

d.

e.

3. Match the terms on the right with the insects on the left.

_____a. Aphids

_____b. Cutworms

_____c. Armyworms

_____d. Mites

_____e. Chinch bugs

_____f. Grasshoppers

_____g. Greenbugs

_____h. Hessian flies

_____i. Southwestern corn borers

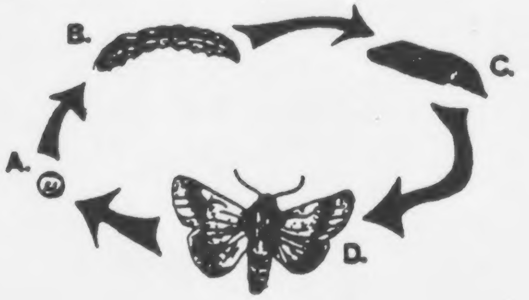
1. Chewing
2. Sucking

4. Arrange the insects listed below into two groups according to harmfu or beneficial.

	Harmful	**Beneficial**
a. Lacewing larva	1.	1.
b. Grasshoppers	2.	2.
c. Ground beetles	3.	3.
d. Cutworms	4.	4.
e. Aphids	5.	5.
f. Lady beetles	6.	6.
g. Armyworms	7.	7.
h. Chinch bug	8.	8.

5. Discuss the economic factors relating to plant insect control.

6. Label a drawing showing the life cycle of most insects.



a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

7. Define the following terms:

   a. Fumigant poison -

   b. Stomach poison -

   c. Contact poison -

8. a. Climate, temperature, and rainfall are considered to be ______________ methods of insect control.

   b. Tillage, planting dates, and improved plant varieties are considered to be ________________________ methods of insect control.

9. Complete the chart below.

INSECT	ADULT DESCRIPTION	DAMAGE	CROPS ATTACKED
Grasshopper			
Fall Armyworm			
Hessian fly			
Alfalfa Weevil			
Greenbug			

PLANT DISEASES
UNIT VIII

TERMINAL OBJECTIVE

After completion of this unit, the student should be able to determine the nature and extent of the plant disease problem. The student should be able to identify the disease and determine means of controlling. This knowledge will be evidenced by scoring eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with plant diseases.
2. Name four ways to control plant diseases.
3. Classify a disease as either a fungus, bacteria, nematode, or a virus.
4. Label a drawing showing the life cycle of smut disease.
5. Construct a chart, when given the disease, telling crops affected, symptoms of the disease, and methods of control in your area.
6. Recognize plant damage and identify the disease causing the damage.
7. Survey the crop plant diseases common in your area and the crops each attacks.

PLANT DISEASES
UNIT VIII

INFORMATION SHEET

I. Terms and definitions

   A. Blight - The rapid discoloration and death of tissue over certain portions of plants

   B. Fungicide - A chemical substance used to kill fungi

   C. Dwarfing - The failure of any part of the plant or the entire plant to develop properly, caused by nutritional deficiencies or a disease condition

   D. Host - The plant in which the disease lives and obtains food

   E. Resistant - The inherited ability of a plant to tolerate and retard growth of disease organisms

   F. Fungus - A plant which lacks chlorophyll and obtains its food from other plant matter, dead or alive

   G. Parasitic plant - A plant which cannot manufacture its own food but lives on other living plants

   H. Ring spots - The yellowish rings on leaves with green tissue inside the ring

   I. Scale - A crust-like, diseased lesion produced as a result of disease infection

   J. Virus - A minute, protein-like substance capable of causing mosaic and other diseases

   K. Conkes - The dead area on a stem surrounded by living tissue

   L. Wilt - The loss of freshness and drooping of leaves

II. Plant disease control

   A. Use of resistant varieties

   B. Eradication of alternate host plants

   C. Treatment of soil

   D. Rotation of crops

   E. Destruction of plant residue

   F. Use of disease-free seed

III. Disease groups

A. Fungus (Transparencies 1 and 2)

1. Seedling disease
2. Root rot
3. Rusts
4. Scab
5. Smuts
6. Rust fungus
7. Ergot

B. Bacteria (Transparencies 3 and 4)

1. Bacterial blight
2. Bacterial wilt
3. Leaf spot
4. Angular leaf spot
5. Corn stalk rot

C. Nematode (Transparency 5)

1. Galls
2. Root knot

D. Virus - Mosaic

IV. Life cycle of smut disease (Transparency 6)

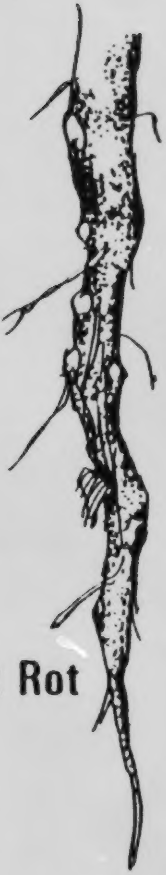
V. Common plant diseases

Disease	Crops Affected	Symptoms	Control
Root rot	Cotton, Alfalfa, Peanuts, Soybeans	Yellowing and bronzing of leaves; leaves become brown and dry	Rotation with other crops; use early maturing varieties
Rusts black stem	Wheat, Oats, Barley, Rye, Grasses	Long brick-red pustules on stems and leaf sheaths; later turn black	Use resistant varieties and early-maturing varieties; treat seed when planting
Smuts	Corn, Sorghum, Oats, Barley, Rye, Wheat	Grayish-white galls on any part of plant, filled with mass of black spores at maturity	Crop rotation; use resistant hybrids; treat seeds
Bacterial blight	Soybeans, Sorghum, Corn	Light to dark-brown irregular spots without marginal halo on leaves, stems, and pods	Destroy crop residue; seed treatment; use resistant varieties
Bacterial wilt	Corn, Alfalfa	Leaves wilt, turn yellow, brown, and plant dies; stems show yellow discolored area	Rotation; use hardy and resistant varieties
Mosaic (virus)	Alfalfa, Soybeans	Plants may dwarf, vein yellowing with dwarfing of stems	Good insect control; rotation of crops
Ergot	Barley, Wheat, Rye	A blue-black, hard mass replaces the kernels in the head of the plant	Rotation; sow disease-free seed

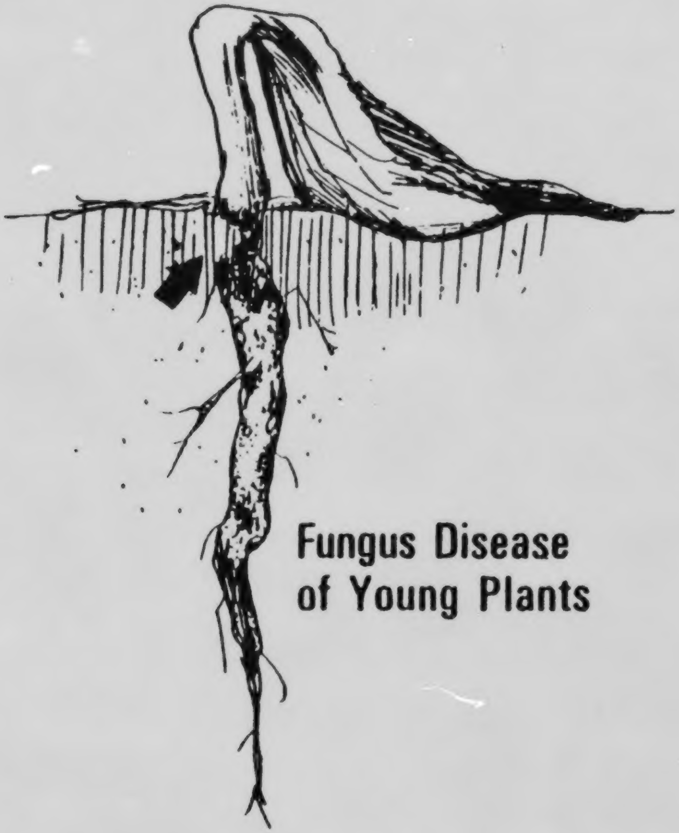
V. Common plant diseases (continued)

Disease	Crops Affected	Symptoms	Control
Nematodes	Wheat, Rye	Rolled or curled leaf, stem enlarged near the base, frequently bent	Use resistant varieties; plant disease-free seed

Fungus Diseases

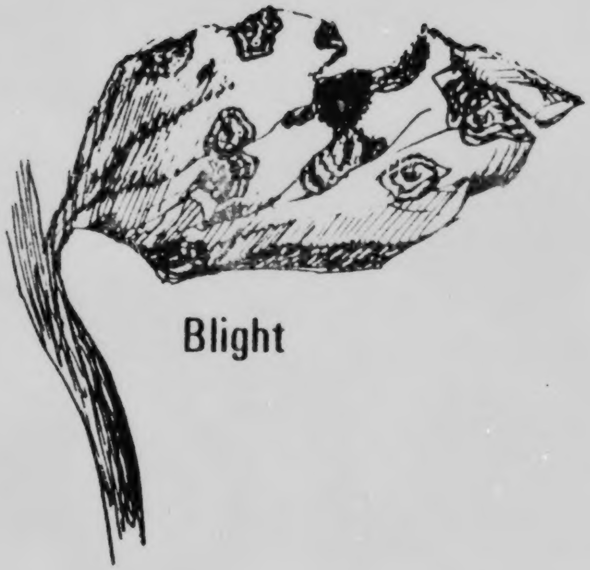


Root Rot

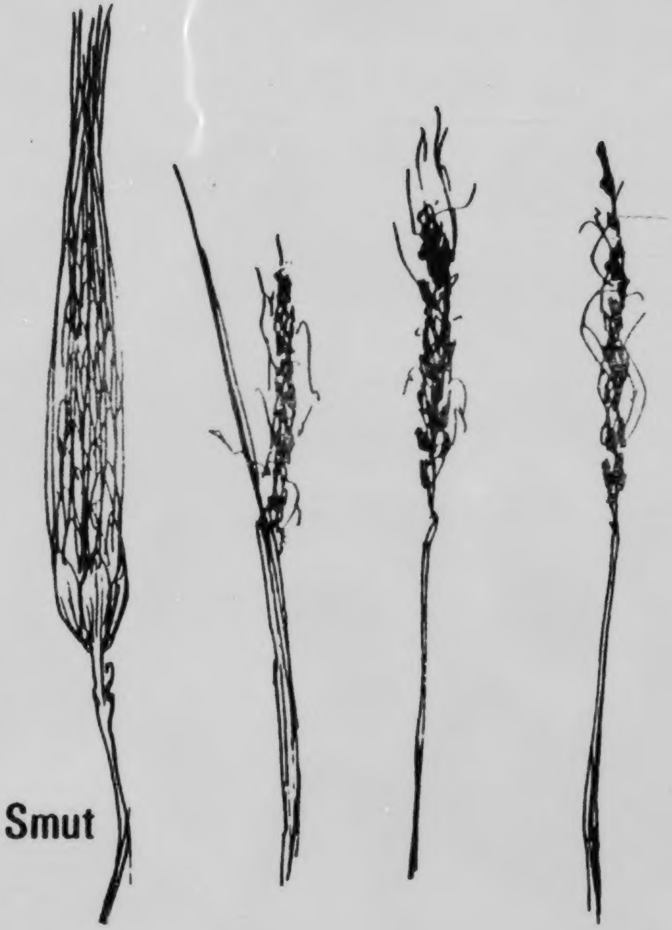


Fungus Disease of Young Plants

Fungus Diseases

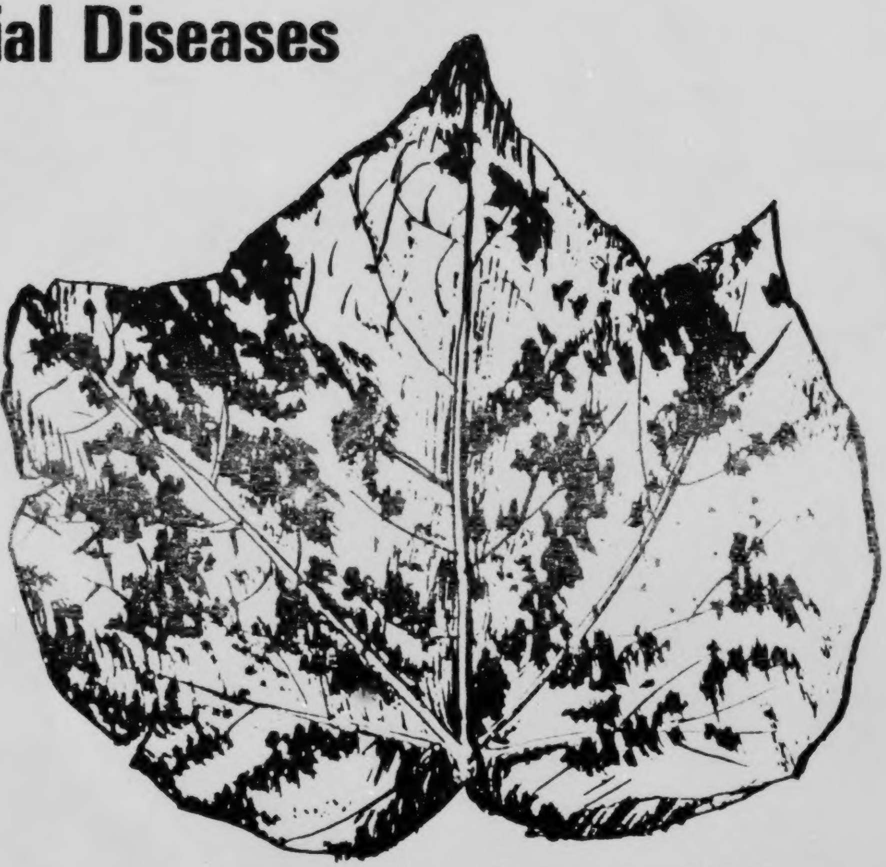


Blight



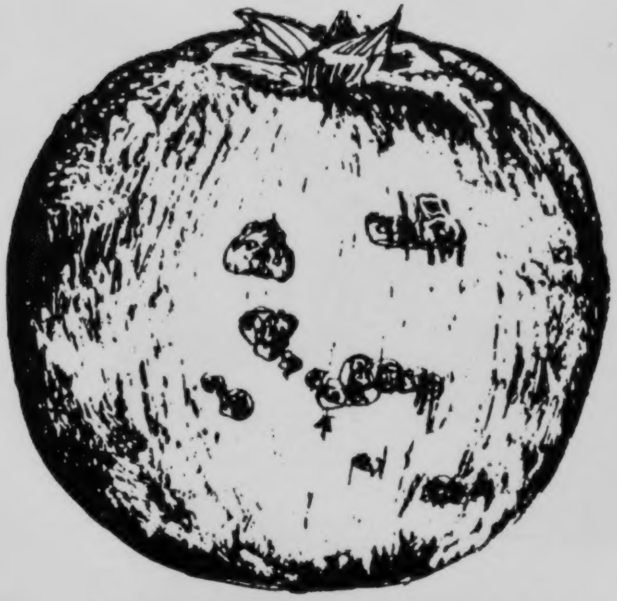
Smut

Bacterial Diseases

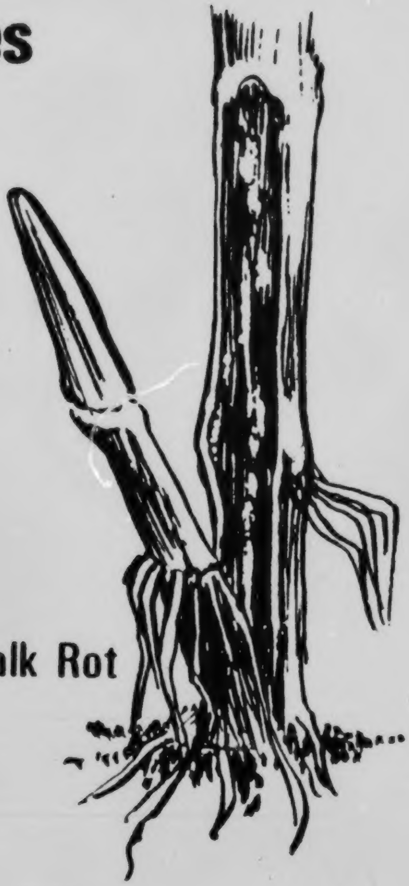


Cotton Leaf Blight

Bacterial Diseases



Bacterial Spot on Tomato

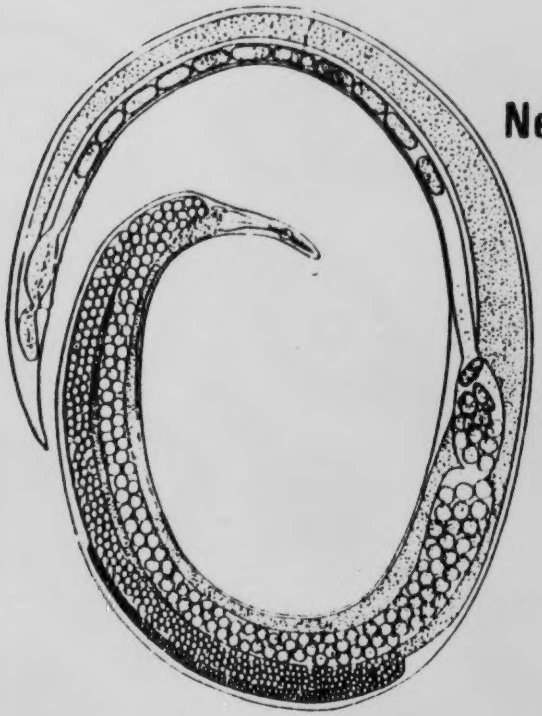


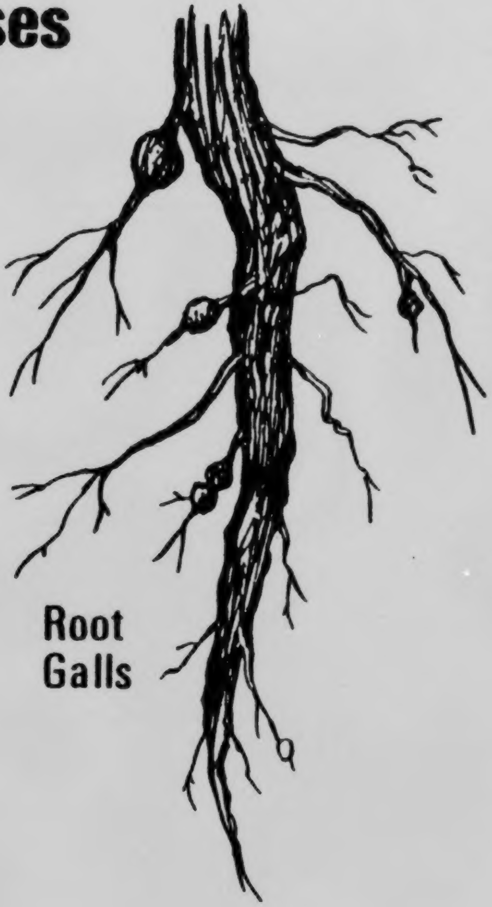
Stalk Rot

Ag. II - 215-D

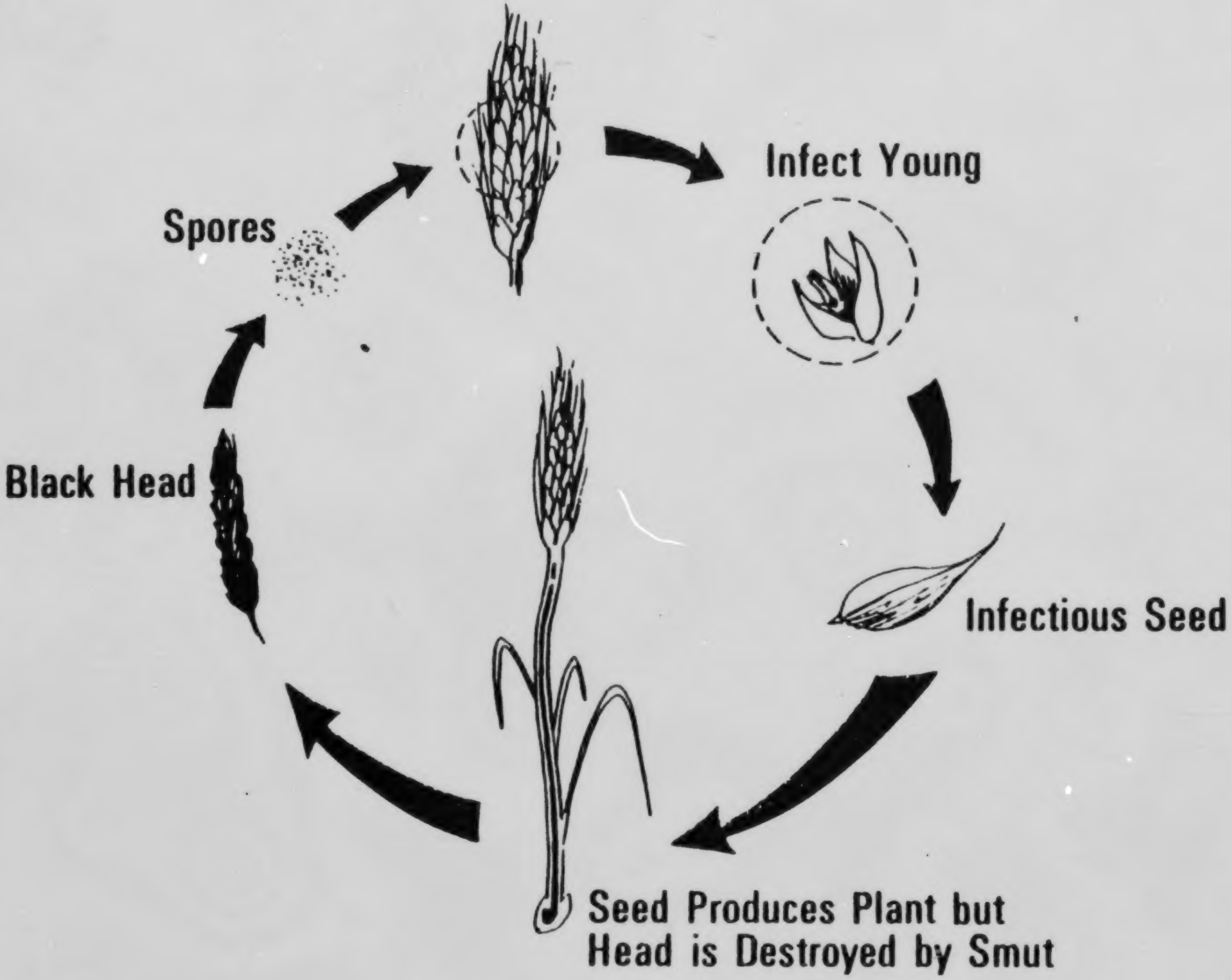
TM 4

Nematode Diseases





Life Cycle of Smuts



Infect Young

Infectious Seed

Seed Produces Plant but
Head is Destroyed by Smut

Black Head

Spores

PLANT DISEASES
UNIT VIII

ASSIGNMENT SHEET #1 - Surveying for Plant Disease Damage

Survey your local community and collect five specimens of plants that are diseased. List the plants below and identify the disease.

Plant	Disease
1.	
2.	
3.	
4.	
5.	

PLANT DISEASES
UNIT VIII

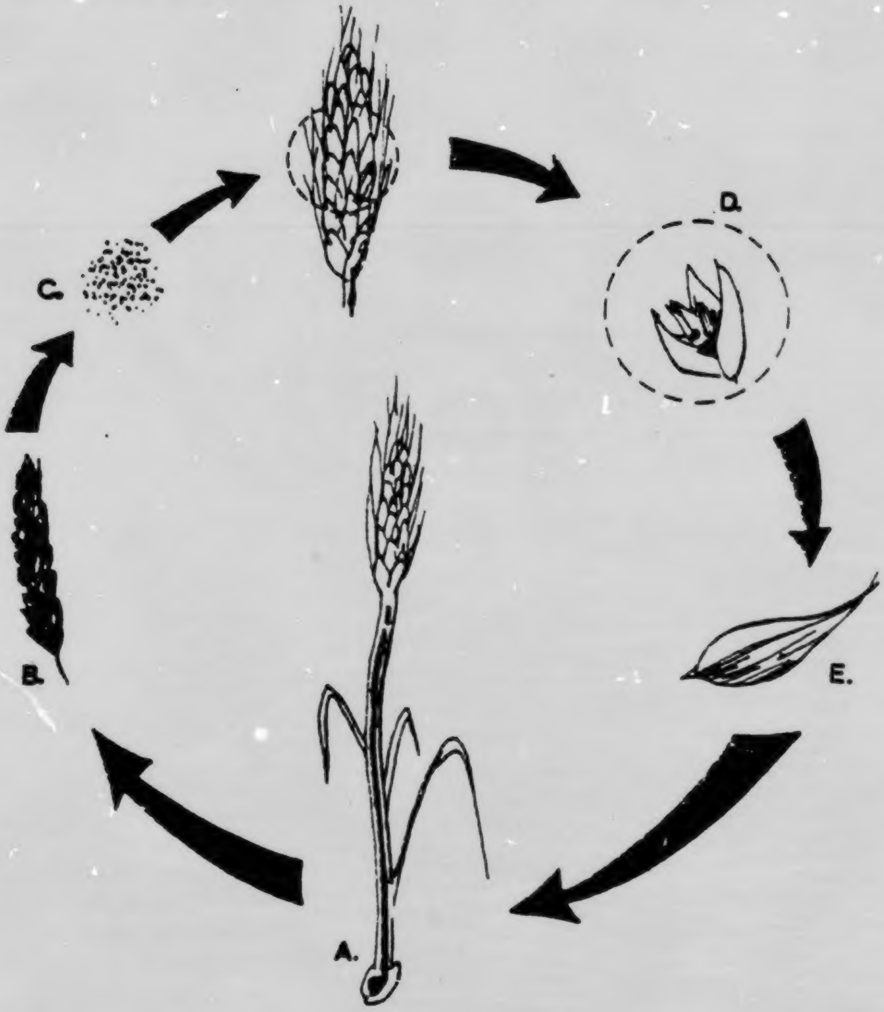
TEST

1. Define the following terms:
   a. Host -
   b. Resistant -
   c. Wilt -
   d. Blight -
   e. Fungicide -

2. Name four ways to control plant diseases.
   a.
   b.
   c.
   d.

3. Arrange the list of diseases below into either a fungus, bacteria, nematode, or virus group. Place an "F" in front of each disease that is considered to be a fungus disease, a "B" in front of the bacteria disease, and "N" in front of the nematode, and a "V" in front of each virus disease.
   a. _____Leaf spot
   b. _____Smut
   c. _____Seedling disease
   d. _____Corn stalk rot
   e. _____Root knot
   f. _____Root rot
   g. _____Blight
   h. _____Galls
   i. _____Mosaic
   j. _____Wilt
   k. _____Rusts

4. Label the drawing below of the life cycle of smut disease.



a. ____________________

b. ____________________

c. ____________________

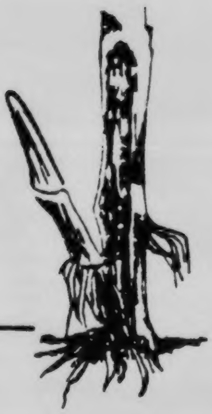
d. ____________________

e. ____________________

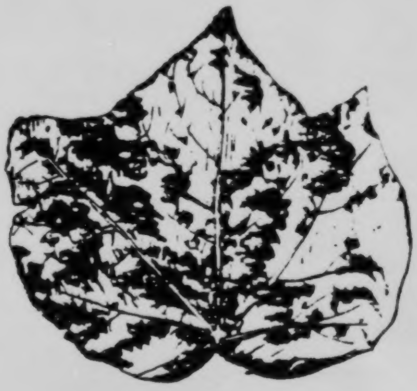
5. **Complete the following chart:**

Disease	Crops Affected	Symptoms	Control
Smut			
Rust			
Ergot			
Bacterial Blight			
Mosaic			

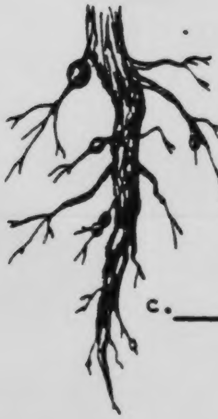
6. **Identify the disease causing the damage to the crops shown below.**



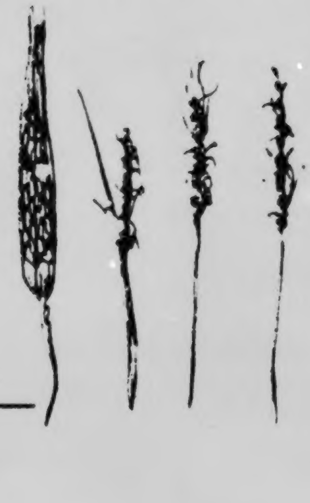
a.__________________



b.________________________



c.________________________



d.________________________

LANDSCAPING
UNIT IX

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to design a basic landscape plan showing the three major areas. The student should be able to recognize basic landscape plants and determine their location within the plan. The student should be able to adapt this knowledge and skill to his or her home farm, community, and school. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with landscaping.
2. Divide a landscape plan into the three major use areas.
3. Recognize and name the overall objectives of a landscape plan.
4. Name five factors to consider in selecting plants for a landscape plan.
5. Name and apply five rules of thumb to follow in drawing a landscape plan.
6. Recognize and apply the basic symbols in drawing a landscape plan.
7. List five functions of plant materials in a farm landscape.
8. Distinguish between trees and shrubs.
9. Collect and identify ten samples of trees or shrubs used in a landscape plan.
10. Draw a complete landscape plan to 1/8 or 1/4 scale.

LANDSCAPING
UNIT IX

INFORMATION SHEET

I. Terms and definitions

  A. Landscape design - The art of developing land for use and enjoyment in such a way to provide maximum utility and beauty

  B. Deciduous - The plants having no living leaves during dormant season; shed their leaves seasonally

  C. Evergreen - The plants retaining functional leaves throughout the year

  D. Formal balance - The precise and methodical treatment of an area to produce geometric exactness

  E. Ground cover - A planting of low plants (as ivy) that cover the ground in place of turf

  F. Conifers - Mostly evergreen trees and shrubs, including forms (as pines) with true cones, and others (as Yews) with an arillate fruit

II. Major areas of plan (Transparency 1)

  A. Public - The area that lies between the street or highway and the house

  B. Private - The area used for outdoor relaxation, rest, entertainment, and general family enjoyment

  C. Service - The area conveniently located near the kitchen, utility room, garage, and driveway

III. Objectives of landscape "plan"

  A. A plane enables one to think of the total landscape instead of just its parts

  B. It helps to organize outdoor space relationships

  C. It is easier and cheaper to change mistakes on paper than to move plants, etc.

  D. It allows development of the landscape to be budgeted

  E. It aids in the planning of details

IV. Factors to consider in selecting trees, shrubs, and other plant materials

- A. Use of the plant material in the landscape
- B. Free from disease
- C. Mature size
    - 1. Tall houses and buildings use tall growing trees
    - 2. Low rambling houses require small trees
- D. Shape
- E. Time of flowering
- F. Fall foliage color
- G. Climatic conditions

V. Rules of thumb in drawing a landscape plan

- A. Should never be planted closer than three feet to house
- B. Do not over plant
- C. Do not cover windows
- D. Plant large trees at least 20 feet from house
- E. Use 1/8 or 1/4 inch scale in landscape drawing
- F. Shrubs around the home should be shortest near the doors and in ascending order so that the tallest are at the corners
- G. Shrubs height should not exceed 2/3 the distance from the ground to the eve of the house

VI. Landscape plan symbols (Transparencies 2, 3, and 4)

VII. Function of plants in farm landscape

- A. Create privacy
- B. Accent and enframe a building and create background setting
- C. Screen objectionable views
- D. Reduce crop and livestock losses
- E. Reduce wind and snow blowing
- F. Beautify the farmstead
- G. Protect gardens, orchards, and ornamentals
- H. Provide food and cover for wildlife

I. Provide shade and reduce glare

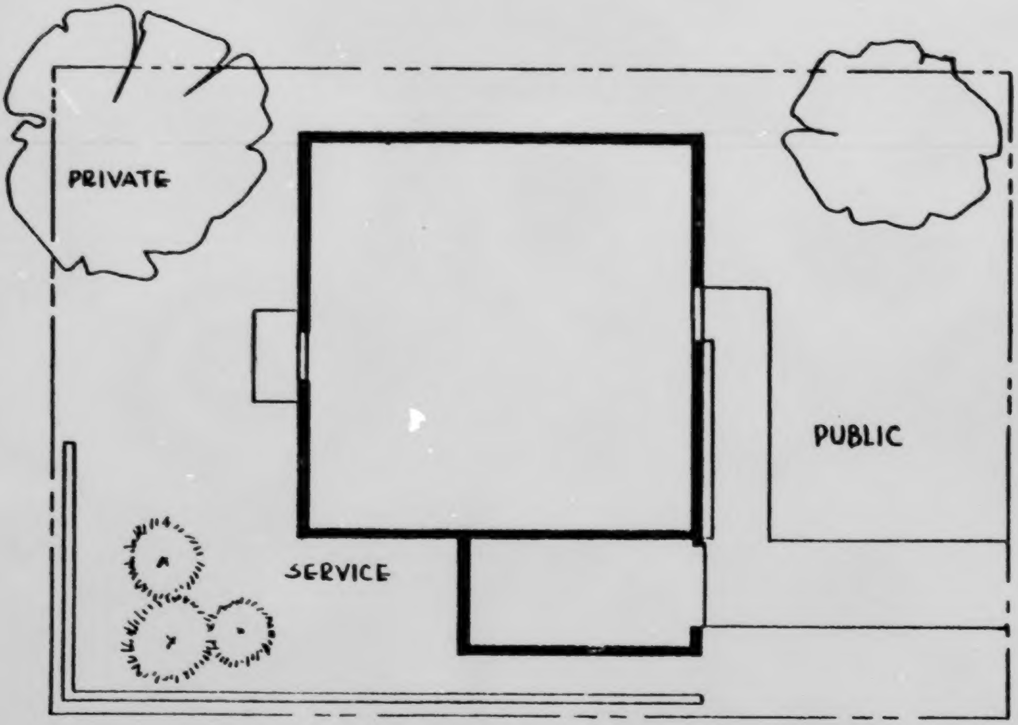
J. Reduce fuel bills

K. Reduce erosion

VIII. Landscape plant material

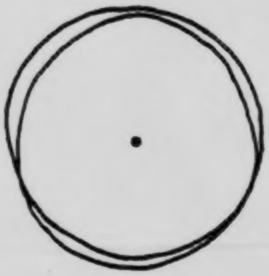
Name	Shrub	Tree	Height	Spread
American Elm		X	70-120'	60-80'
Burford Holly	X		8- 10'	3- 5'
Pyracantha	X		8- 10'	8-10'
Honey Locust		X	40- 60'	30-40'
Redbud		X	15- 30'	10-20'
Red Cedar		X	20- 90'	7-30'
Glossy Abelia	X		6- 7'	4- 5'
Sycamore		X	70-100'	70-80'
Green Ash		X	50- 70'	40'
Arborvitae	X		4- 6'	3- 4'
Pfitzer Juniper	X		4- 8'	10-18'
Euonymus	X		4- 8'	5-10'
Cotoneaster	X		10- 12'	8-10'
Scotch Pine		X	40- 50'	18-20'
Austrian Pine		X	40- 60'	18-25'
Lilac Common	X		12- 15'	12-15'
Mimosa		X	30- 40'	40-50'
Forsythia	X		6- 8'	6- 8'
Bald Cypress		X	50- 70'	30-50'
Honey Suckle	X		10- 12'	8-10'
Privet	X		2- 4'	2- 4'
Lombarly Poplar		X	50- 60'	10-15'
Pin Oak		X	50- 80'	30-40'
Bur Oak		X	75- 90'	50-70'
Nandina	X		4- 8'	3- 4'

Major Areas of Landscape Plan

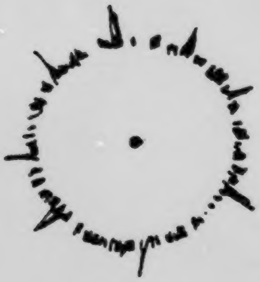

PRIVATE
PUBLIC
SERVICE

LANDSCAPE PLANNING SYMBOLS

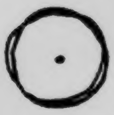
1. Deciduous Tree



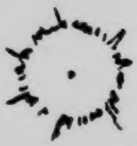
2. Evergreen Tree



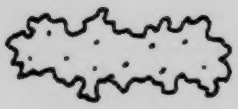
3. Deciduous Shrub



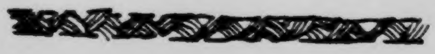
4. Evergreen Shrub



5. Ground Cover or Flowers

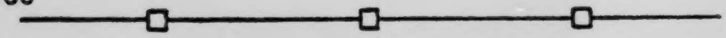


6. Sheared Hedge

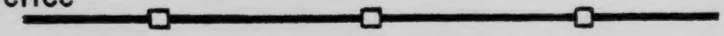


LANDSCAPE PLANNING SYMBOLS

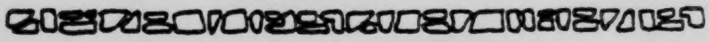
7. Open or Wire Fence



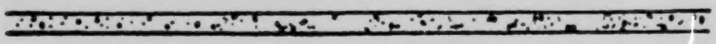
8. Screen or Solid Fence



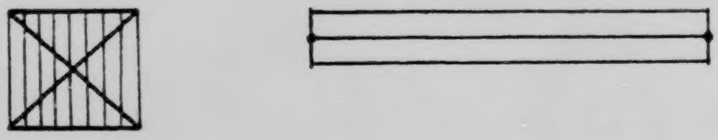
9. Retaining Wall, Rock



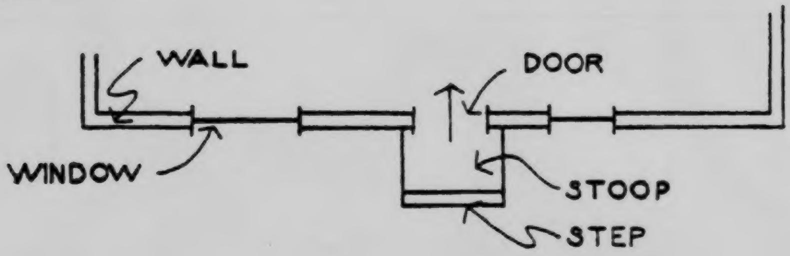
10. Retaining Wall, Concrete



11. Clothes Line

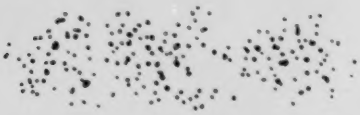


12. Building Details

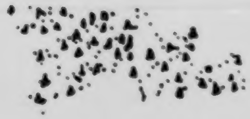

WALL
DOOR
WINDOW
STOOP
STEP

LANDSCAPE PLANNING SYMBOLS

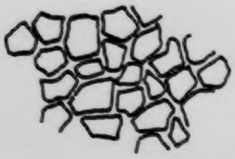
13. Gravel Surface



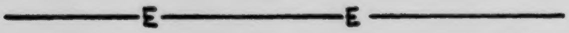
14. Concrete Surface



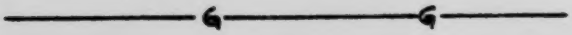
15. Flagstone or Cut Stone Surface



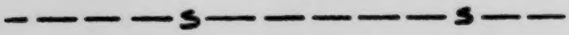
16. Electric Line



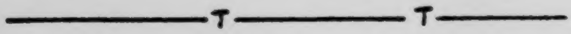
17. Gas Line



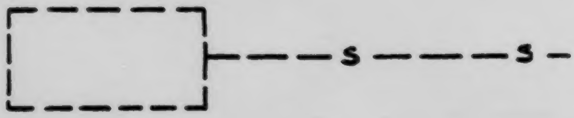
18. Sewer or Septic Line



19. Telephone Line



20. Septic Tank



LANDSCAPING
UNIT IX

ASSIGNMENT SHEET #1--COLLECTING AND IDENTIFYING TREES AND SHRUBS

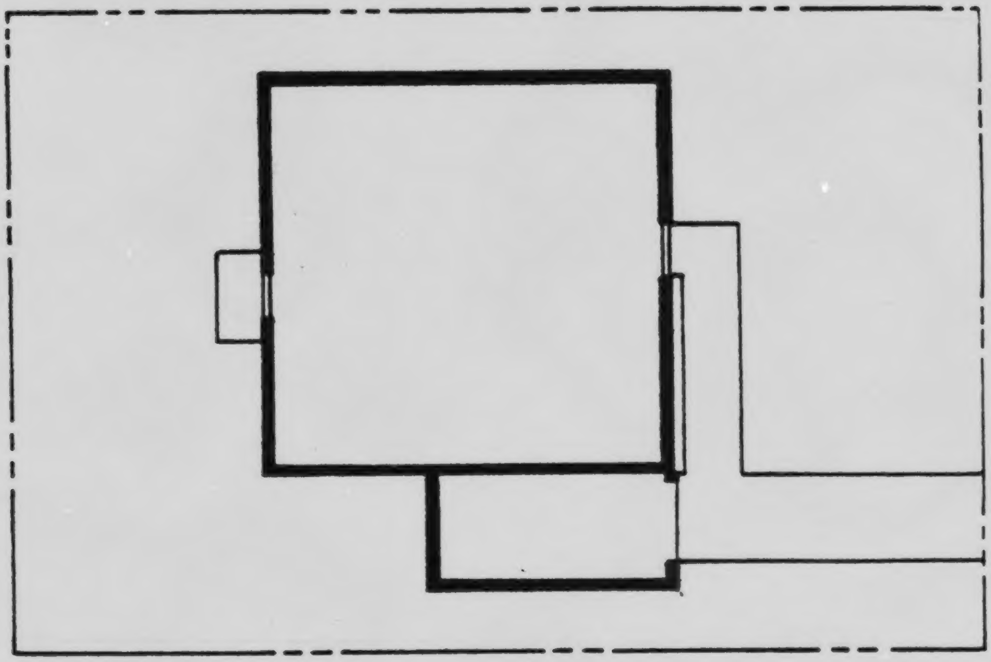
Collect and identify ten samples of trees or shrubs found in your local community. Bring plants to class with the completed chart.

Plant Name	Tree	Shrub
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

LANDSCAPING
UNIT IX

ASSIGNMENT SHEET #2--DRAWING A LANDSCAPE PLAN

Using the basic symbols, draw a rough draft of a landscape plan showing the location of trees, shrubs, flower beds, or other features. Your plan should be attractive, interesting, convenient, and useful. (NOTE: Follow the suggested steps sheet.)



ASSIGNMENT SHEET #2

Suggested steps to designing a residential landscape site:

Step I. Obtain an analysis of family landscape needs and a complete site analysis.

Step II. Layout or divide yard into separate use areas.

Step III. Locate and design elements to be constructed. (In their respective use areas.)

Example: Public Area -

DRIVE
PARKING
ENTRANCE LANDING
WALKWAYS
FENCE

Service Area -

CLOTHESLINE
GARAGE STORAGE
COMPOST PILE
WALKWAYS

Family Living Area -

PATIO
WALKWAYS

Step IV. Locate trees.

Shade
Enframement
Background
Screen
Color

Step V. Locate shrubs.

Separate areas
Screen
Accent
Soften

Step VI. Locate flower beds.

LANDSCAPING
UNIT IX

TEST

1. Define the following terms:
   a. Evergreen plant -
   b. Conifers -
   c. Deciduous -
   d. Landscape design -
   e. Ground cover -

2. Name four overall objectives of a landscape plan.
   a.
   b.
   c.
   d.

3. Name five factors to consider in selecting plant materials for a landscape plan.
   a.
   b.
   c.
   d.
   e.

4. Name five functions of plants in a farm landscape.
   a.
   b.
   c.
   d.
   e.

5. What are four rules of thumb an individual should apply in drawing a landscape plan?

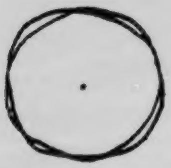
a.

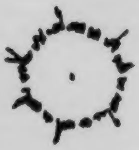
b.

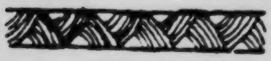
c.

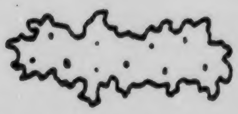
d.

6. Identify the following symbols used in a landscape plan.

a. 

b. 

c. 

d. 

7. Arrange the list of landscape plants below into two groups - trees and shrubs. Place a "T" in the blank indicating a tree and an "S" indicating a shrub.

_____a. Green Ash

_____b. Forsythia

_____c. Pin Oak

_____d. Cotoneaster

_____e. Bur Oak

_____f. Red Cedar

_____g. Euonymus

_____h. Common Lilac

_____i. Pfitzer Juniper

_____j. Bald Cypress

_____k. Sycamore

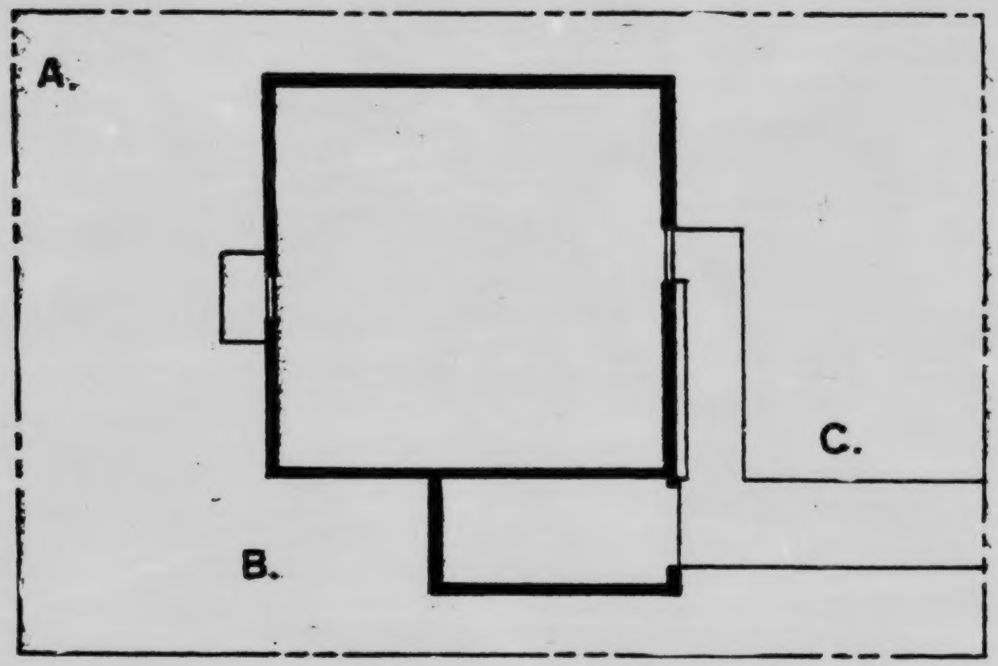
_____l. Lombardy Poplar

_____m. Burford Holly

_____n. Elm

_____o. Nandina

8. Label this landscape plan according to the three major use areas.



A.

B.

C.

IRRIGATION
UNIT X

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to define irrigation, name irrigation systems, know availability of water sources, define waters qualities, calculate rate at application, describe the economic value of irrigation. This knowledge will be evidenced through completion of assignment sheet and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms concerning irrigation with their current definitions.
2. Name four types of irrigation systems.
3. List the two sources of water.
4. Name three factors that determine water qualities.
5. Match soil texture with inches of available water.
6. Describe the economic value of irrigation.
7. Calculate rate of application.

IRRIGATION
UNIT X

INFORMATION SHEET

I. Terms and definitions

A. Soil profile - A vertical section of the soil from the surface through all its horizons into the parent material

B. Water user - Any person who is withdrawing or using ground water from within the boundaries of the district in an amount not less than (1) one acre foot/year

C. Water table - The level beneath the ground surface of which the soil is saturated with water

D. Gravitational water - When films become so thick that attraction forces can no longer hold moisture against the force of gravity, water starts to drain down through the soil

E. Capillary water - That portion of the soil moisture which is held by cohesive forces greater than gravity, and yet is available for the growth of plants

F. Hygroscopic water - Moisture that is held so strongly to the soil particles that it is not available for plant use

G. Field capacity - The soil contains the maxium available water, the greatest amount of water it can hold against gravity

H. Wilting - That amount of soil moisture content at which plants can no longer grow properly

I. Available water - Amount of water a soil can hold between field capacity and wilting point

J. Precipitation - The fall of rain or snow

K. Irrigation - To supply water by artificial means to the soil

L. Entry - The rate water is absorbed by a soil; determined by the size and number of soil pores (soil texture)

M. Evaporation - Moisture lost from the soil

N. Storage capactiy - Ability of soils to hold water, depending upon the type and size of particles upon soil depth

O. Capillary rate - Rate of movement of water through soil - controlled by soil structure and texture

P. Water right - The right for a person to lawfully divert and use water

Q. Vegatative covering - Amount of ground growth

R. Transpiration ratio - The amount of water required by various crops to produce a pound of dry matter

S. Acre-foot - Volume of water sufficient to cover one acre one foot deep. It contains 43,560 cubic feet of water

T. Acre-inch - Volume of water sufficient to cover an acre one inch deep. It contains 3,630 cubic feet

II. Types of irrigation systems (TM 1)

A. Sprinklers - Water pressure is forced into the air with nozzles or perforations in pipes and falls as an artificial rain

B. Surface - Spreading water by ditch, gated pipe, flood, and drip

C. Underground - Is provided by raising or creating a water table so that capillarity will feed roots of crops. This system makes use of deep ditches, tile, pipe or drip tubes

D. Combinations - Use of two or more systems of irrigation

III. Sources of water for irrigation

A. Underground

1. Dug wells
2. Drilled wells (TM 2)
3. Driven wells
4. Springs

B. Above ground

1. Streams
2. Individual ponds
3. Large reservoirs
4. Cisterns
5. Tail water pits

IV. Factors that determine water qualities

A. Concentration and composition of dissolved constituents in the water

B. The drainage characteristics of the land to which the water will be applied

C. Drainage requirements

D. Salinity hazards

E. Sodium hazards

F. Other hazards

1. Boron
2. Chloride

V. Application of water to soil texture

Texture of Soil (entire profile)	Inches of Available Water
Coarse Sand	4.50
Fine Sand	6.00
Fine Sandy Loam	9.00
Silt Loam	12.00
Clay Loam	13.00
Heavy Clay	12.00

(NOTE: This chart explains the inches of water that textures of the soil will hold in the entire profile with 6 feet average profile)

VI. Economic value of irrigation

A. Irrigation land in Kansas in 1978 was 3,417,981 acres

(NOTE: See Supplemental Information Sheet #1 for additional information)

B. Increases value per acre

C. Increases crop production

VII. Rate of application

A. Formula for determining rate of application through a channal: $q = av$

q= quantity of water flow in cubic feet per second

a= cross section area of water (in square feet)

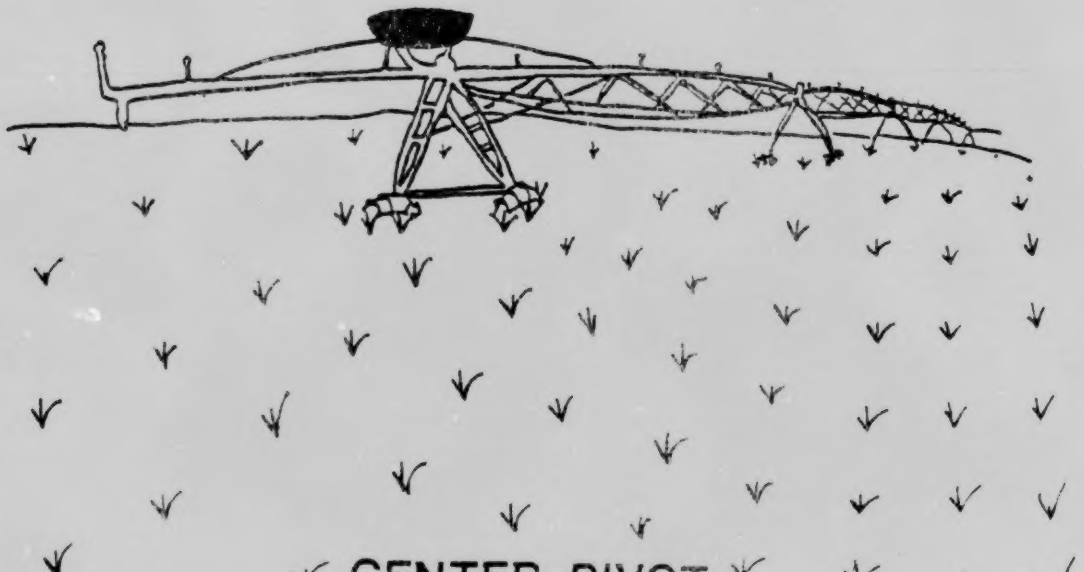
v= water velocity flowing through an opening or canal (in feet per second)

STATE SUMMARY - 1978 KANSAS IRRIGATION SURVEY

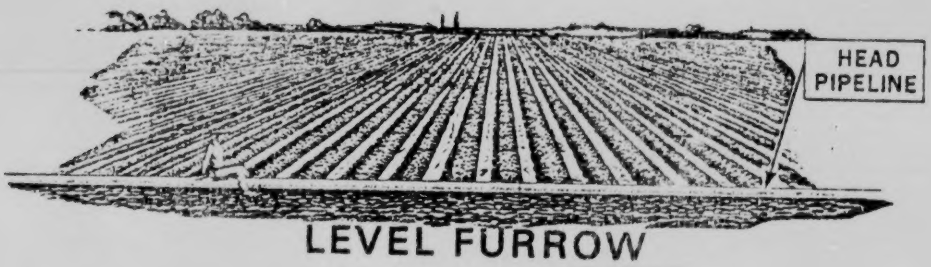
		Gravity Irrigated (acres)		Sprinkler Irrigated (acres)			
Area	Total Irrigated Acres	Open Ditch	Gated Pipe	Center Pivot	Tow Line & Side Roll	Traveling Big Gun	Other Sprinkler
Northwest Area	638,445	43,325	412,381	160,531	14,655	2,130	5,423
Southwest Area	2,371,598	258,513	1,446,865	658,810	4,310	700	2,400
South Central Area	239,122	5,900	61,457	154,685	5,480	7,710	3,890
Southeast Area	22,265	2,110	1,800	5,390	480	11,435	1,050
Northeast Area	146,551	26,240	62,481	34,412	5,620	11,528	6,270
TOTAL	3,417,981	336,088	1,984,984	1,013,828	30,545	33,503	19,033

SUPPLEMENTAL INFORMATION SHEET #1

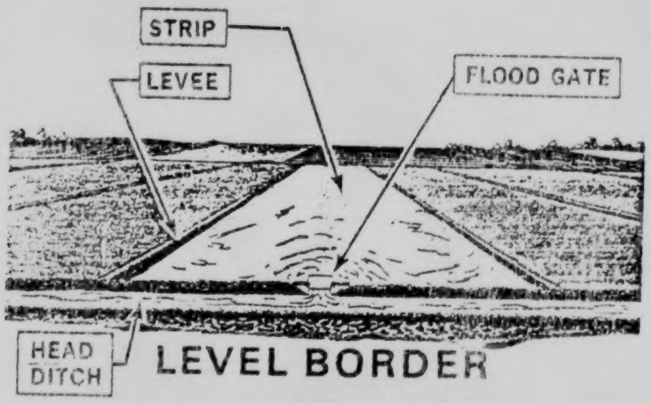
IRRIGATION METHODS



CENTER-PIVOT


HEAD
PIPELINE

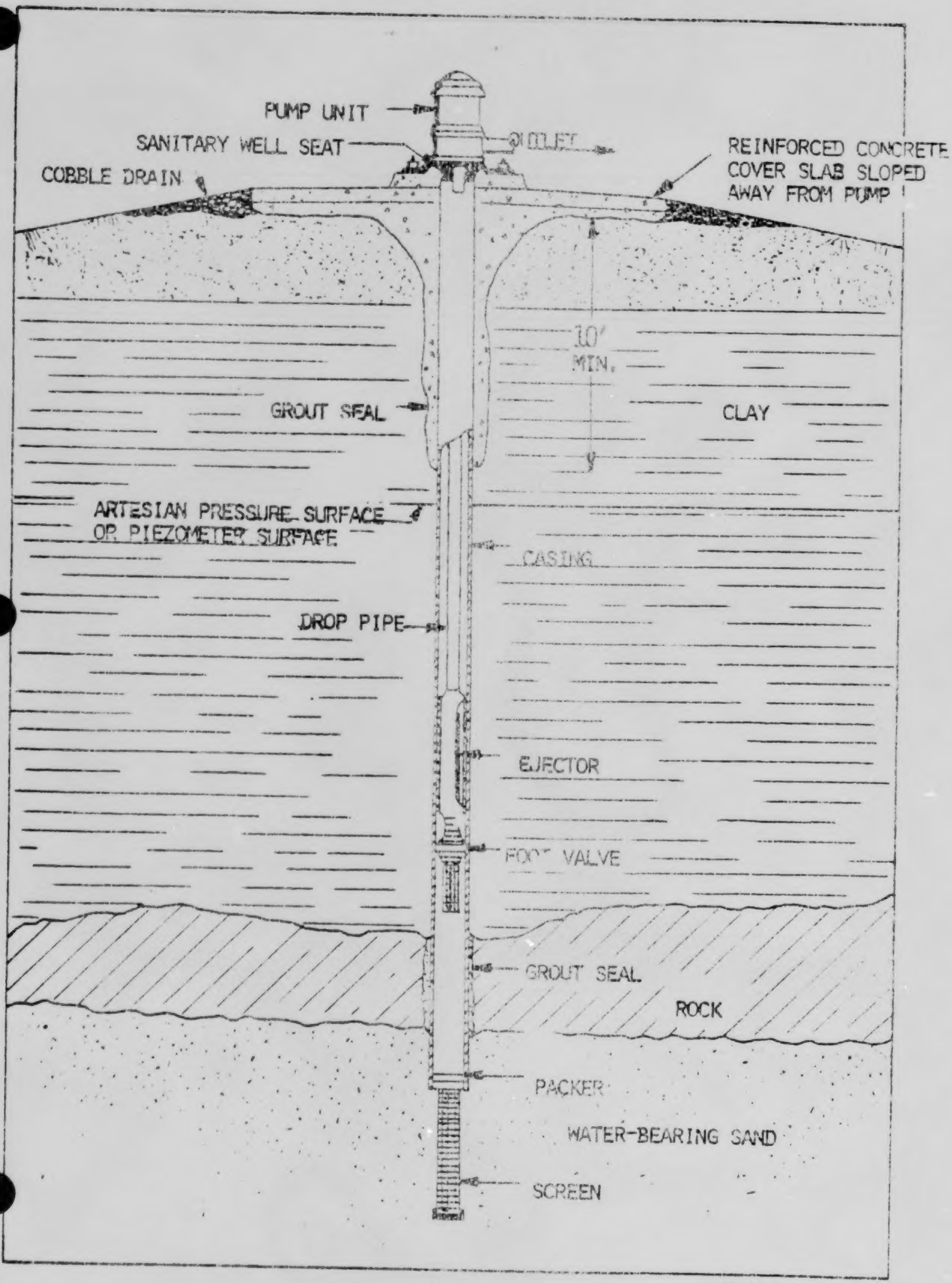
LEVEL FURROW


STRIP
LEVEE
FLOOD GATE
HEAD
DITCH

LEVEL BORDER

DRILLED WELL

Ag. II - 267-D


PUMP UNIT
SANITARY WELL SEAT
OUTLET
REINFORCED CONCRETE COVER SLAB SLOPED AWAY FROM PUMP
COBBLE DRAIN
10' MIN.
GROUT SEAL
CLAY
ARTESIAN PRESSURE SURFACE OR PIEZOMETER SURFACE
CASING
DROP PIPE
EJECTOR
FOOT VALVE
GROUT SEAL
ROCK
PACKER
WATER-BEARING SAND
SCREEN

IRRIGATION
UNIT X

ASSIGNMENT SHEET # 1 - DETERMINING THE RATE OF WATER FLOW THROUGH SOIL TEXTURES

This assignment requires the follwing items:

1. Three No. 10 tin cans
2. Several quarts of water
3. Three types of soil (sandy, loam, and clay)
4. Catch pan for tail water

Take No. 10 cans, number and label as to soil type, then punch several holes in the botton of each. Place a small sample of soil in each can, then tap soil slightly. Example: sandy in can No. 1, loam in can No. 2, clay in can No. 3. After this is completed, pour water at a slow rate into each can and note the speed that the water moves through each can. Catch tail water in pan. Repeat this test three times to get proper method to determine rate of flow.

Results of water flow tests:

	First Test	Second Test	Third Test	Average
Sandy -				
Loam -				
Clay -				

$$\left(\text{Average} = \frac{\text{first test + second test + third test}}{3}\right)$$

IRRIGATION
UNIT X

TEST

1. Match the terms on the left with the correct definition on the right.

_____a. Water rights
_____b. Tail water
_____c. Field capacity
_____d. Wilting point
_____e. Precipitation
_____f. Irrigation
_____g. Evaporation
_____h. Vegetative cover
_____i. Transpiration ratio
_____j. Acre foot

1. Volume of water sufficient to cover one acre one foot deep
2. Amount of ground growth
3. The fall of rain or snow
4. Water content of air
5. Supply water when most need during growing season
6. That amount of soil moisture content at which plants can no longer grow properly
7. Amount of water required by various crops to produce a pound of dry matter
8. The soil contains maximum available water, the greatest amount of water it can hold against gravity
9. Describes water accumulating at the lower end of the irrigation run
10. The right for a person to lawfully divert and use water

2. Name the four types of irrigation systems.

a.
b.
c.
d.

3. List two sources of water.

a.
b.

4. Name three factors that determine water quality.

   a.

   b.

   c.

5. Match the texture on the left with the inches of available water on the right.

   _____a. Coarse sand 1. 4.00

   _____b. Fine sand 2. 12.00

   _____c. Fine sandy loam 3. 9.00

   _____d. Silt loam 4. 4.50

   _____e. Caly loam 5. 6.00

   _____f. Heavy clay 6. 12.00

   7. 13.00

6. Describe the economic value of irrigation as to number of acres and ways value of land increases.

7. Give an explanation for the letters in the following formula: q = av

   a. q =

   b. a =

   c. v =

ANIMAL NUTRIENTS
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to recognize and use the major nutrients in a livestock feed ration. The student should be able to name functions of nutrients and recognize deficiencies. This will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define six terms that deal with animal nutrients.
2. Name the six major nutrients.
3. Distinguish between the two types of proteins.
4. Match nutrients with their appropriate functions.
5. Select from a list the major minerals.
6. Name three minor minerals.
7. Name or match the correct sources for each of the following nutrients:
    a. Vitamins
    b. Minerals
    c. Proteins
    d. Carbohydrates
    e. Fats
8. Match the deficiency symptoms of vitamins and minerals when given a list of the vitamins and minerals.
9. Name four factors to consider when using feed additives.
10. Name two purposes of growth stimulants as a feed additive.
11. Name two growth stimulants.
12. Discuss antibiotics as used in feed additives.
13. List two antibiotics used in feed additives.

ANIMAL NUTRIENTS
UNIT I

INFORMATION SHEET

I. Terms and definitions

- A. Nutrient - The part of feed which supplies building materials and energy fuel for animals.
- B. Total digestible nutrients (TDN) - The proportion of a feed which is usable to supply energy to animals.
- C. Feed additives - The substances added to a ration to perform a specified function.
- D. Protein - The nutrient which supplies building materials for body growth and repair.
- E. Digestible protein - The proportion of a feed which represents protein the animal can use.
- F. Starch - A carbohydrate which supplies energy to animals.
- G. Vitamins - The complex chemicals essential for normal body functions.
- H. Minerals - The elements which are necessary for proper body functions and life processes.
- I. Amino acids - The building blocks of protein.
- J. Antibiotics - The substances used in small amounts to help prevent and control certain disease in animals.
- K. Urea - A synthetic protein substitute used in a ruminant's ration.
- L. Essential amino acids - Those that cannot be produced by the animal itself.

II. Major nutrients

- A. Water
- B. Proteins
- C. Carbohydrates
- D. Minerals
- E. Vitamins
- F. Fats

III. Types of proteins
    A. Plant
        1. Soybean meal
        2. Cottonseed meal
        3. Linseed meal
        4. Peanut oil meal
    B. Animal
        1. Tankage
        2. Fish meal
        3. Meat scraps
        4. Dried milk products

IV. Functions of nutrients
    A. Water
        1. Removes waste material
        2. Regulates body temperature
        3. Dissolves food particles
        4. Maintains osmotic pressure
        5. Maintains structure of cells
        6. Carries dissolved food materials
    B. Proteins
        1. Develop muscle tissue
        2. Supply energy
        3. Repair and maintain worn-out body tissue
    C. Carbohydrates
        1. Supply energy
        2. Supply heat
        3. Store energy as body fat
    D. Minerals
        1. Skeletal structure
        2. Chemical reaction
        3. Regulate pH of digestive tract fluids
        4. Essential in all body processes

E. Vitamins

  1. Vitamin A

    a. Aids in development of nerve cells

    b. Aids in development of tissues

    c. Aids in disease resistance

    d. Aids in development of embryo

  2. Vitamin D

    a. Builds bones

    b. Builds teeth

    c. Assimilates Ca and P in the body

  3. Vitamin E - Aids in reproduction

  4. Vitamin K - Aids in blood clotting

  5. Vitamin B

    a. Prevents disease

    b. Promotes growth

    c. Prevents skin infections

F. Fats

  1. Source of energy

  2. Storage of energy in body

  3. Source of insulation

V. Major minerals

  A. Calcium

  B. Phosphorus

  C. Sodium chloride

  D. Potassium

  E. Sulfur

VI. Minor minerals

  A. Iron

  B. Copper

  C. Zinc

  D. Iodine

  E. Cobalt

  F. Magnesium

VII. Sources of nutrients

- A. Proteins
  1. Cottonseed meal
  2. Linseed meal
  3. Soybean meal
  4. Skim milk
  5. Tankage
  6. Alfalfa hay
- B. Carbohydrates
  1. Cereal grains
  2. Non-legume roughage
  3. Molasses
- C. Minerals
  1. Calcium - Good quality roughage
  2. Phosphorus - High protein concentrate, steamed bone meal, and rock phosphorus
  3. Sodium chloride - Salt block
  4. Potassium - Feed sources
  5. Sulfur - Feed sources
  6. Iron - Good roughage
  7. Copper - Feed sources (Use pre-mix)
  8. Zinc - Feed sources (Use pre-mix)
  9. Iodine - Iodized salt
  10. Magnesium - Magnesium sulphate
- D. Vitamins
  1. A - Alfalfa hay, dehydrated alfalfa meal, and fish oil
  2. B - Produced in the rumen (Commercial sources)
  3. D - Sun cured hay of good quality
  4. K - Produced in the rumen (Commercial sources)
  5. E - Good quality leafy alfalfa hay or green feed and cereal grains
- E. Fats
  1. Tallow
  2. Animal products
  3. Seeds

VIII. Deficiency symptoms of vitamins and minerals

- A. Vitamins
  - 1. Vitamin A
    - a. Blindness
    - b. Loss of young
    - c. Poor development of bones
    - d. Slow growth
  - 2. Vitamin D
    - a. Bone deformities
    - b. Rickets
  - 3. Vitamin E - Loss of young
  - 4. Vitamin K
    - a. Internal bleeding
    - b. Lung deformities resulting in death
  - 5. Vitamin B complex
    - a. Muscular weakness
    - b. Abnormalities in young
- B. Minerals
  - 1. Calcium
    - a. Rickets
    - b. Broken bones
    - c. Poor gains
    - d. Milk fever
  - 2. Phosphorus
    - a. Lameness
    - b. Stiffness of joints
    - c. Lower appetite
    - d. Lower rate of gain
    - e. Lower milk production
    - f. Decreases heat cycle
  - 3. Sodium chloride
    - a. Lack of appetite
    - b. Unthrifty appearance
  - 4. Potassium
    - a. Slow growth rate
    - b. Reduced feed consumption

        c. Stiffness
        d. Shock
    5. Sulfur - Unthriftiness
    6. Iron - Anemia
    7. Iodine
        a. Hairless pigs
        b. Goiter
    8. Copper - Anemia
    9. Cobalt
        a. Loss of appetite
        b. Unthriftiness
        c. Delayed sexual development
    10. Magnesium
        a. Reduced fertility
        b. Abortion
        c. Deformed young
        d. Enlarged joints
        e. Stiffness
        f. Twisted legs

IX. Factors to consider when using feed additives
    A. Policies set by local feed firms
    B. Precautions when using feed additives
    C. FDA and State Standards and regulations
    D. Veterinarian recommendations

X. Purposes of growth stimulants
    A. Stimulate weight gains
    B. Reduce feed requirements per unit of gain

XI. Feed additives
    A. Stilbestrol
    B. Progesterone
    C. Testosterone

XII. Use of antibiotics in feed additives
   A. Increase gains
   B. Prevent certain diseases

XIII. Antibiotics used in feed additives
   A. Aureomycin
   B. Terramycin
   C. Penicillin
   D. Streptomycin

MAJOR NUTRIENTS

CARBOHYDRATES

FATS

MINERALS

PROTEINS

VITAMINS

WATER

ANIMAL NUTRIENTS
UNIT I

TEST

1. Match the following terms with the appropriate definitions on the right.

_____a. Feed additives
_____b. Proteins
_____c. Vitamins
_____d. Minerals
_____e. Amino acids
_____f. Starches
_____g. Essential amino acids

1. Complex chemicals essential for normal body functions
2. Building blocks of protein
3. Elements which are necessary for proper body functions and life processes
4. Nutrients which supply building material for body growth and repair
5. Carbohydrates which supply energy to animals
6. Substances added to a ration to perform a specified function
7. Amino acids, those that cannot be produced by the animal itself

2. Name the six major nutrients.

a.
b.
c.
d.
e.
f.

3. From the list below, place a "P" in front of each plant protein and an "A" in front of each animal protein.

_____a. Tankage
_____b. Soybean meal
_____c. Cottonseed meal
_____d. Fish meal
_____e. Meat scraps
_____f. Linseed meal
_____g. Dried milk products

4. Match the feed nutrients on the left with their appropriate functions on the right. All functions may be used.

_____a. Proteins
_____b. Carbohydrates
_____c. Fats
_____d. Vitamins
_____e. Minerals
_____f. Water
_____g. Peanut oil meal

1. Develops skin tissue
2. Develops nerve tissue
3. Source of energy
4. Removes waste material
5. Regulates body temperature
6. Stores energy in body
7. Insulation
8. Skeletal structure

5. Which minerals listed below are considered major minerals? Place an "X" beside each major mineral.

_____a. Sulfur
_____b. Potassium
_____c. Cobalt
_____d. Calcium
_____e. Iodine
_____f. Iron
_____g. Phosphorus

6. Name three minor minerals.

a.
b.
c.

7. A. Name four sources of protein in animal nutrients

a.
b.
c.
d.

B. Match the sources on the right with their appropriate nutrients.

_____a. Carbohydrates
_____b. Fats

1. Tallow
2. Cereal grains
3. Molasses
4. Animal fats
5. Seeds

C. Match the minerals on the left with their appropriate source on the right. All sources given may be used.

_____a. Calcium
_____b. Phosphorus
_____c. Potassium
_____d. Sodium chloride
_____e. Iron

1. Trace mineralized salt
2. High forage ration
3. Salt
4. Steamed bone meal
5. Rock phosphate
6. Good quality roughage

D. Match the vitamins on the left with their appropriate source on the right. Sources may be used twice, and all sources given may be used.

_____a. Vitamin A
_____b. Vitamin B
_____c. Vitamin D
_____d. Vitamin E
_____e. Vitamin K

1. Green plants and cereal grains
2. Sun cured hay
3. Fish oil
4. Produced in rumen (Commercial sources)
5. Dehydrated alfalfa meal
6. Good quality alfalfa hay

8. A. Match the deficiencies on the right with the vitamins on the left. All deficiencies may be used.

_____a. Vitamin B
_____b. Vitamin D
_____c. Vitamin K
_____d. Vitamin A
_____e. Vitamin E

1. Internal bleeding
2. Muscular weakness
3. Loss of young
4. Rickets
5. Blindness

B. Match the minerals with their deficiency symptom by placing the number of the deficiency by the mineral.

_____a. Calcium
_____b. Phosphorus
_____c. Potassium
_____d. Iron
_____e. Magnesium
_____f. Iodine

1. Lameness
2. Anemia
3. Rickets
4. Hairless pigs
5. Goiter
6. Abortion
7. Stiffness

9. Name four factors to consider when using feed additives.

a.
b.
c.
d.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to discuss the composition of feeds. The student should be able to divide feeds into the various classifications according to Morrison Feeds and Feeding. The student should be able to combine feeds to make a satisfactory ration. The student should score eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After the completion of this unit, the student should be able to:

1. Define six terms associated with feeds and feeding.
2. Complete a chart showing the breakdown of feeds.
3. Distinguish between compound and simple sugars.
4. Match feeds to the proper categories according to Morrison Feeds and Feeding classification.
5. List three requirements that every commercial feed company must state on a feed tag.
6. List the procedures to determine the water and dry matter content of feed.
7. Compare the composition of feeds as to digestible protein and total digestible nutrients using Morrison Feeds and Feeding (Table I).
8. Calculate the digestible protein and total digestible nutrients of feeds.
9. List four factors to consider when formulating rations.
10. Name three methods used to determine the value of feeds.
11. Calculate the cost of protein and total digestible nutrients of feed.
12. Balance a ration using the Pearson Square method.
13. Demonstrate the ability to balance a sample ration for digestible protein, total digestible nutrients and dry matter.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

INFORMATION SHEET

I. Terms and definitions

- A. Roughage - The feeds high in fiber and low in digestible nutrients
- B. Silage - The feed crops cured and stored green or without drying
- C. Concentrates - The feeds which have a high proportion of digestible nutrients and not much fiber
- D. Ration - The daily feed which an animal receives
- E. Balanced ration - A ration which contains the nutrients in the amount and proportion needed by an animal
- F. Fiber - The tough part of feed which is not very digestible
- G. Supplement - Anything which is added to a feed
- H. Total digestible nutrients (TDN) - The proportion of a feed which is usable to supply energy to the animal
- I. Digestible protein (DP) - The proportion of a feed which represents protein the animal can use
- J. Pasturage - The plant growth available to animals on the range or in the pasture
- K. Proteins - The organic compounds consisting of C, H, O, N, and S and sometimes P, Fe
- L. Fats - The organic compounds of C, H, and O
- M. Dry matter (DM) - The average percentage of dry matter in feed found by weighing the feed then drying and re-weighing
- N. Net energy - That amount of energy needed to maintain body weight

II. Composition of feeds (Transparency 1)

Water	Dry Matter		
Ash (Minerals)		Organic Matter	
	Protein	Carbohydrates	Fats
		Nitrogen Free Extract	Crude Fiber
		Simple Sugar	Cellulose
		Compound Sugar	
		Starch	

III. Types of carbohydrate sugars
- A. Simple sugar
  - 1. Glucose
  - 2. Frutose
  - 3. Galactose
- B. Compound sugar
  - 1. Maltose - 2 glucose units
  - 2. Sucrose - 1 glucose + 1 fructose
  - 3. Lactose - 1 glucose + 1 galactose

  (NOTE: Carbohydrates are composed of crude fiber and nitrogen free extract. Cellulose is made up of many molecules of glucose.)

IV. Classification of feeds
- A. Roughage (Transparency 2)
  - 1. Dry
    - a. Hays
      - 1. Grass
      - 2. Legumes
    - b. Hulls
      - 1. Cottonseed
      - 2. Peanut
    - c. Straws
      - 1. Wheat
      - 2. Oats
      - 3. Barley
  - 2. Green
    - a. Roots
    - b. Grasses
    - c. Tubers
  - 3. Silage
    - a. Corn forage
    - b. Sorghum forage
    - c. Grass
- B. Concentrates (Transparency 3)

1. Grains
    a. Corn
    b. Wheat
    c. Oats
    d. Milo
    e. Barley
2. Grain by-products
    a. Wheat bran
    b. Wheat standard millings
3. Molasses
    a. Cane
    b. Beet
4. Oil meals
    a. Soybean
    b. Cottonseed
    c. Linseed
    d. Peanut
5. Animal products
    a. Meat scraps
    b. Tankage
    c. Fish meal
    d. Dried dairy products

(NOTE: Laws govern the sale of commerical feeds, mineral mixtures, and stock tonics to protect the purchaser. The ingredients of a mixture must be labeled, but the percentage of each is not required.)

V. Feed tag requirements (Transparency 4)
    A. Minimum crude protein
    B. Minimum crude fat
    C. Maximum crude fiber

VI. Procedures for determining water and dry matter content of feed
    A. Weigh feed
    B. Dry in oven
    C. Weigh dried feed

D. Subtract dried feed weight from feed weight

(NOTE: The difference in weights is due to the water content of the feed.)

E. Divide difference by the feed weight to obtain water content percentage

(NOTE: Feed grains normally contain 10% water and 90% dry matter.)

VII. Composition of feeds for digestible protein and total digestible nutrients

FEED	DP	TDN
Milo grain	8.5%	79.4%
Corn dent grade #1	6.9%	81.9%
Wheat, average all types	11.1%	80.0%
Oats - Pacific states	7.0%	72.2%
Alfalfa hay, average all types and all analysis	10.9%	50.7%

(NOTE: Figures taken from Morrison Feeds and Feeding.)

VIII. Determining the amount of digestible protein and total digestible nutrients of feeds

A. Determine the percentage of digestible protein (DP) and total digestible nutrients (TDN) of the feeds using Morrison Feeds and Feeding

B. Multiply the percentage of digestible protein and total digestible nutrients in each feed by the number of pounds of the feed to be used in the ration

C. Example:

1. Determine the amount of DP and TDN of 30 pounds of whole cottonseed

2. Cottonseed, whole

DP - 17.1 TDN - 90.8

3.

17.1% DP	90.8% TDN
30 Pounds	30 Pounds
5.13 Pounds DP	27.24 Pounds TDN

IX. Important factors to consider when formulating feed mixtures

A. Specific nutrient requirements for the livestock or poultry to be fed

B. Palatability of the ingredients to be used

C. Digestibility of the ingredients available

D. Vitamin content of the ingredients available

E. Mineral content of the ingredients

F. Availabiltiy of substitute ingredients

G. Cost of the ingredients

X. Methods of determining the value of feed

A. Cost per pound of TD

B. Cost per pound of protein

C. Cost of feed

XI. Determining the cost of protein and total digestible nutrients

A. Determining the cost of protein

1. Amount of protein in feed

2. Divide selling price of feeds by protein content

3. Example:

	Cost	Protein Content
Corn	3.60 = 39.5 cents per pound*	9.1
Milo	3.15 = 28.8 cents per pound	10.9

* 3.60 ÷ 9.1 = 39.5 cents per pound

B. Determining the cost of total digestible nutrients

1. Amount of TDN in feed

2. Divide selling price of feeds by TDN

3. Example:

	Cost	TDN Content
Corn	3.60 = 4.5 cents per pound*	80.1
Milo	3.15 = 3.4 cents per pound	79.4

* 3.60 ÷ 80.1 = 4.5 cents per pound

XII. Procedures for using the Pearson Square Method

A. Obtain feeding standards for class of livestock from feed composition tables

B. Draw a square and place the desired protein level of the ration in the center of the square

C. At the upper left-hand corner of the square, write the ingredient and its protein content

D. At the lower left-hand corner, write the other ingredient and its protein content

E. Subtract diagonally across the square (the smaller number from the larger number), and record the difference at the corners on the right-hand side

(NOTE: The number at the upper right-hand corner gives the parts of the first ingredient by weight, and the number at the lower right-hand corner gives the parts of the second ingredient by weight to make a ration with the desired protein level.)

F. To determine what percent of the ration would be the first ingredient, divide the parts of the first ingredient by the total parts. The remaining percentage will be the second ingredient.

(NOTE: The Pearson Square Method is a method for balancing one nutrient requirement, with no consideration given to the vitamin, mineral, and other nutritive requirements.)

XIII. Balancing rations for DM, DP, and TDN

A. Figure animal's requirements

B. Figure DM, DP, and TDN of feed to be used in ration

C. Example: 400-pound fattening beef animal

Corn	.850	.075	.800
(7# fed)	7	7	7
	5.95	5.25	5.60
Cottonseed meal	.91	.333	.652
(2# fed)	2	2	2
	1.82	.666	1.30
Cottonseed hulls	.908	0	.437
(5# fed)	5	5	5
	4.54	0	2.18
Requirements for 400-pound fattening beef animal	9.6-12.1	1.05-1.15	7.4-8.6

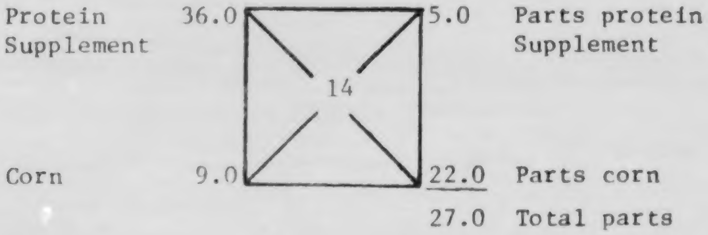
7-pounds corn	5.95	.525	5.60
2-pounds cottonseed meal	1.82	.666	1.30
5-pounds cottonseed hulls	4.54	.000	2.18
	12.31	1.191	9.08

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

BALANCING RATIONS USING PEARSON SQUARE METHOD

A swine producer has 80-pound pigs to which he desires to feed a 14% protein ration until they reach 150 pounds in weight. He has on hand corn containing 9% protein. He can buy a 36% protein supplement, which is reinforced with minerals and vitamins. The following procedures would be used to determine the percent of corn and protein supplement to produce a 14% protein ration.

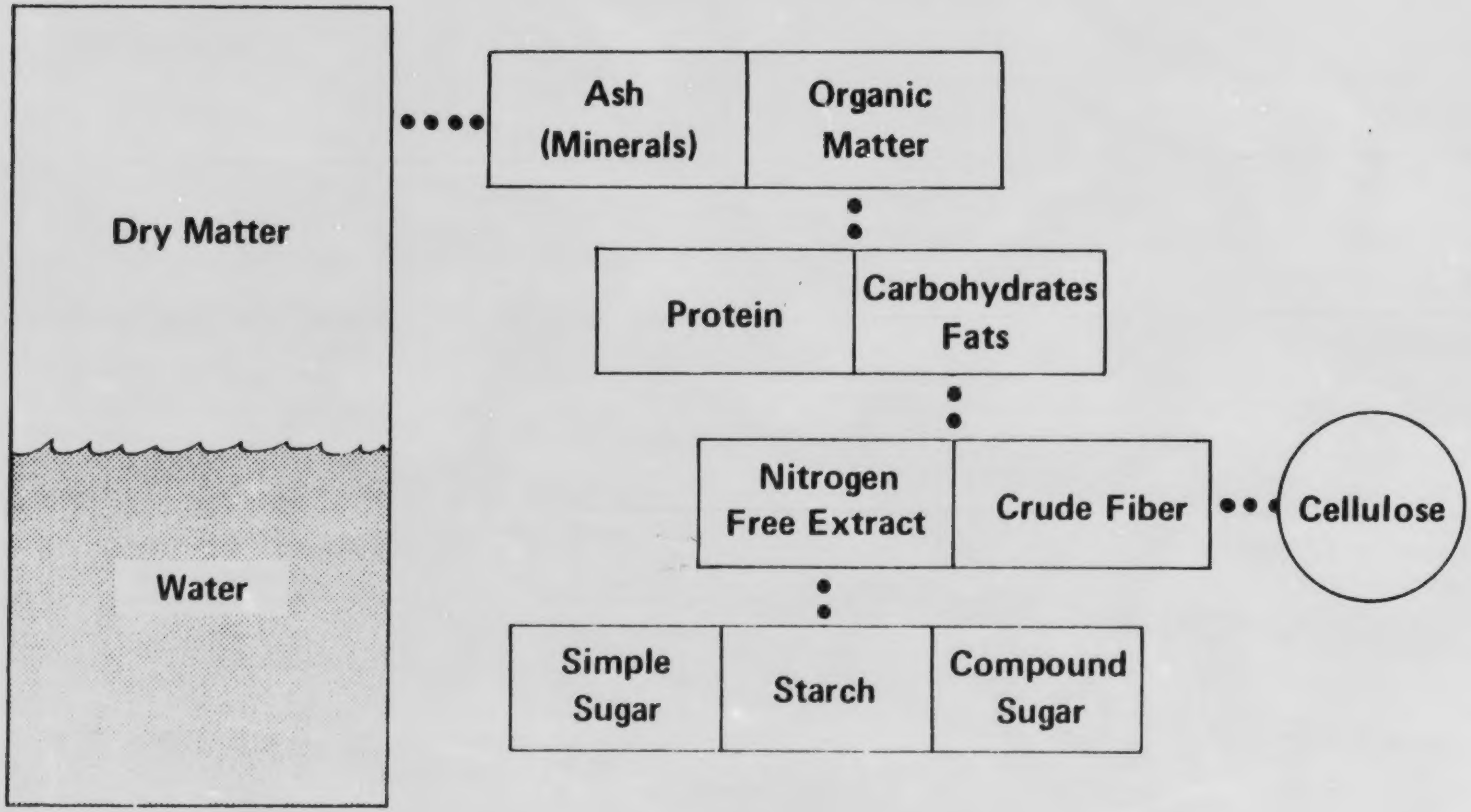
1. Draw a square, and place the number 14 in the center.
2. At the upper left-hand corner of the square, write protein supplement and its protein content (36.0).
3. At the lower left-hand corner of the square, write corn and its protein content (9.0).
4. Subtract diagonally across the square and record the difference at the corners on the right-hand side. (36 - 14 = 22.0; 14 - 9 = 5.0)



(NOTE: The number at the upper right-hand corner gives the parts of concentrate by weight, and the number at the lower right-hand corner gives the parts of corn by weight to make a ration of 14% protein.)

5. To determine what percentage of the ration would be corn, divide the parts of corn by the total parts: 22 ÷ 27 = 81.5% corn. The remainder, 18.%5, would be supplement.

Feed Composition



Dry Matter

Water

Ash (Minerals)

Organic Matter

Protein

Carbohydrates Fats

Nitrogen Free Extract

Crude Fiber

Cellulose

Simple Sugar

Starch

Compound Sugar

Ag. II - 35-E

Classification of Roughages

GREEN ROUGHAGES

Roots

Grasses

Tubers

DRY ROUGHAGES

Hays–
  Grass and Legume

Hulls–
  Peanut and Cottonseed

Straw–
  Oat, Wheat,
  Barley, and Rice

SILAGE

Corn

Sorghum

Grass

TM 2

Ag. II - 37-E

Classification of Concentrates

OIL MEALS

- Soybean
- Cottonseed
- Linseed
- Peanut

MOLASSES

- Cane
- Beet

GRAIN BY-PRODUCTS

- Wheat bran
- Wheat standard middlings

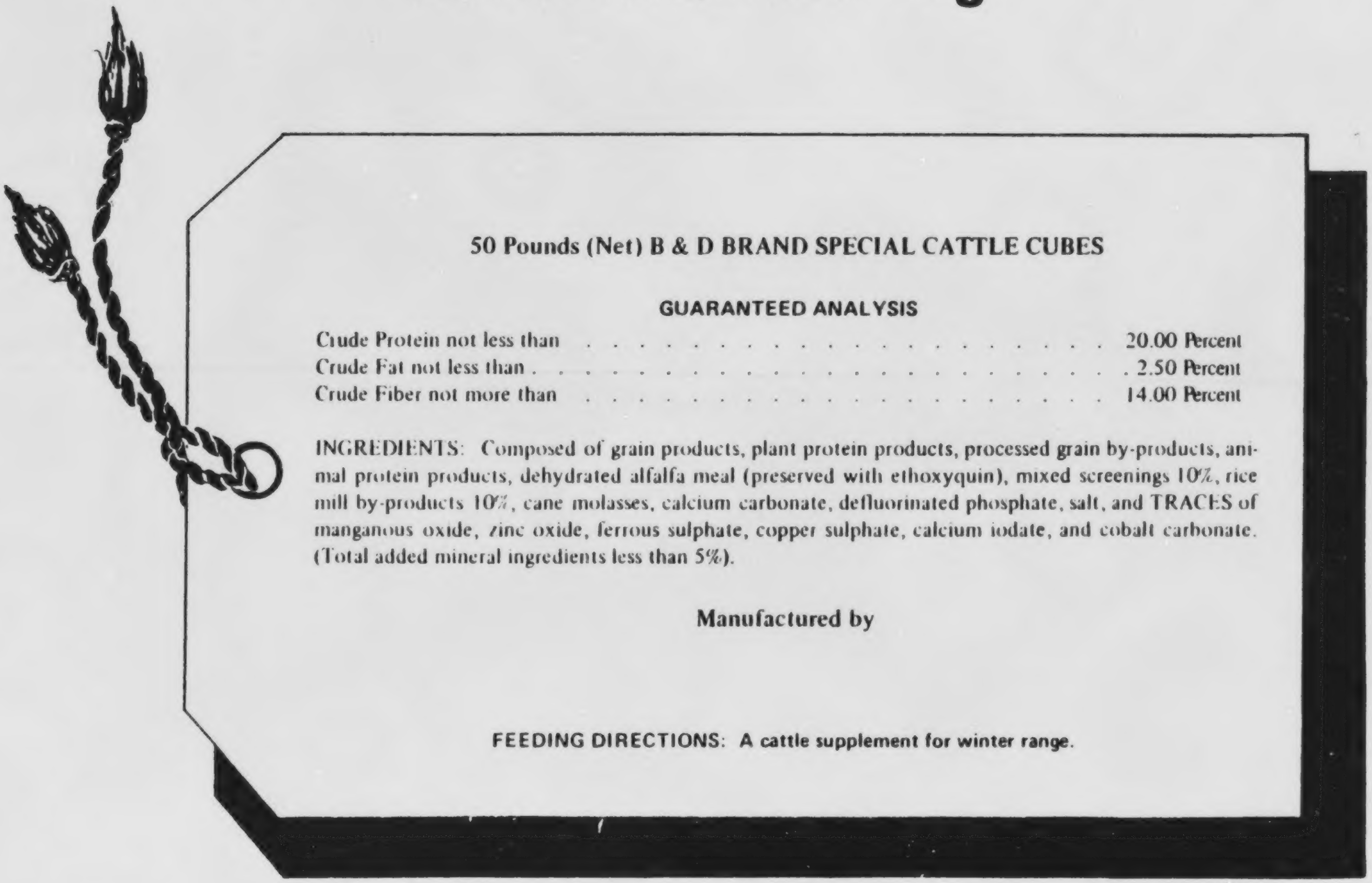
ANIMAL PRODUCTS

- Meat scraps
- Tankage
- Fish meal
- Dried dairy products

GRAINS

- Barley
- Wheat
- Corn
- Milo
- Oats

Commercial Feed Tag



50 Pounds (Net) B & D BRAND SPECIAL CATTLE CUBES

GUARANTEED ANALYSIS

Crude Protein not less than	20.00 Percent
Crude Fat not less than	2.50 Percent
Crude Fiber not more than	14.00 Percent

INGREDIENTS: Composed of grain products, plant protein products, processed grain by-products, animal protein products, dehydrated alfalfa meal (preserved with ethoxyquin), mixed screenings 10%, rice mill by-products 10%, cane molasses, calcium carbonate, defluorinated phosphate, salt, and TRACES of manganous oxide, zinc oxide, ferrous sulphate, copper sulphate, calcium iodate, and cobalt carbonate. (Total added mineral ingredients less than 5%).

Manufactured by

FEEDING DIRECTIONS: A cattle supplement for winter range.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ASSIGNMENT SHEET #1 - DETERMINING TDN AND DP CONTENT OF BASIC FEEDS

Using Morrison Feeds and Feeding (Table 1), calculate the TDN and DP of the follwoing feeds.

I. How many pounds of TDN are there in:

   A. 50 pounds of No. 1 yellow corn

   B. 30 pounds of milo grain

   C. 50 pounds of wheat, average all types

   D. 50 pounds of oats, Pacific states

   E. 20 pounds of alfalfa hay, all analysis

II. How many pounds of DP are there in each of the above pounds of feed?

   A.

   B.

   C.

   D.

   E.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ASSIGNMENT SHEET #2 - BALANCING RATIONS USING PEARSON'S SQUARE

Determine the total parts needed in a 16% ration using 8.5% DP milo and 41.0% cottonseed meal. Show your work.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ASSIGNMENT SHEET # 3 - WORKING A SAMPLE RATION FOR A FATTENING BEEF ANIMAL

Balance a sample ration for an 800-pound fattening beef animal for DM, TDN, and DP. Use Morrison Feeds and Feeding for reference.

Animal Requirements	DM	DP	TDN

Use the Following grains:

Corn dent grade #1 -

Soybean meal 41% -

Cottonseed hulls -

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ASSIGNMENT SHEET #4 - WORKING A SAMPLE RATION FOR FATTENING SWINE

Balance a sample ration for a 125-pound swine fattening animal for DM, DP, and TDN. Use Morrison Feeds and Feeding for reference.

Animal requirements DM DP TDN

Use the following grains:

Wheat, average all types -

Corn dent grade #1 -

Soybean meal 41% -

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

TEST

1. Define the following terms.
   a. Silage -
   b. Supplement -
   c. Concentrate -
   d. Ration -
   e. Fiber -
   f. Protein -

2. Complete the following chart showing the composition of feeds.

a. Water b.

c. Ash d. Organic Matter

e. f.

g. Nitrogen Free Extract h.

i. l. Cellulose

j.

k. Starch

3. In the list of sugars below, place an "S" in front of simple sugars and a "C" in front of compound sugars.

_____ a. Glucose
_____ b. Maltose
_____ c. Sucrose
_____ d. Galactose
_____ e. Fructose
_____ f. Lactose

4. Match the following feeds to the correct category.

_____a. Corn
_____b. Wheat straw
_____c. Soybean meal
_____d. Milo
_____e. Alfalfa hay
_____f. Cottonseed meal
_____g. Wheat bran
_____h. Sorghum forage

1. Dry roughage
2. Green roughage
3. Concentrate
4. Silage

5. List three requirements that must be stated on a commercial feed tag.

a.
b.
c.

6. List the procedures for determining water and dry matter content of feed.

a.
b.
c.
d.
e.

7. List four factors to consider when formulating rations.

a.
b.
c.
d.

8. Name three methods used to determine the value of feeds.

a.
b.
c.

9. Determine which of the following grains would be more economical.

	DP	TDN	COST/CWT
a. Milo	8.5	79.4	$2.00
b. Wheat	11.3	79.6	$1.75

10. Balance a 16% protein ration for a growing pig, using the Pearson Square Method.

__________# Milo

__________# Tankage

Milo - 8.5

Tankage - 60%

ANIMAL DIGESTION
UNIT III

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinguish between the different types of digestive systems of farm animals. The student should be able to recognize the difference between chemical and mechanical digestion. This knowledge will be evidenced by a score of eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with the digestive process.
2. Label drawings showing the parts of the digestive tract of the cow, pig, and chicken.
3. Distinguish between a simple and a compound stomach.
4. Classify animals according to their types of digestive systems.
5. Name three functions of hormones in the digestive process.
6. List the digestive processes that take place in the mouth.
7. Name five glands that aid in the breakdown of feeds.
8. Distinguish between chemical and mechanical digestion.

ANIMAL DIGESTION
UNIT III

INFORMATION SHEET

I. Terms and definitions

   A. Digestion - The process of preparing the food ingredients for passage into the blood stream.

   B. Absorption - The passing of food materials from the digestive tube into the body after they are digested or dissolved.

   C. Enzymes - The organic compounds with power to break down other organic compounds without themselves' being changed.

   D. Hormones - The internal body secretions that regulate various body processes.

   E. Mastication - The grinding or chewing of feed to aid in digestion.

   F. Metabolism - The chemical change which food undergoes within the body.

   G. Excretion - The removal of water and waste material from the body.

   H. Regurgitation - The process whereby food eaten by ruminants is carried from the second stomach and the rumen into the gullet and then forced up to the mouth for chewing.

   I. Feces - The manure or the undigested material and wastes expelled at the end of the digestive tube.

   J. Pancreatic juice - The clear, watery fluid with an alkaline reaction secreted by the pancreas that aids in feed breakdown.

   K. Bile - The thin, yellowish-brown or greenish liquid secreted by the liver.

   L. Ruminant animal - The animal with four compartments in the stomach.

II. Digestive systems of swine, chicken, and cow (Transparencies 1, 2, & 3)

III. Types of stomachs

   A. Simple - one compartment (Transparencies 1 and 2)

   B. Compound - four compartments (Transparency 3)

IV. Classification of animals according to digestive systems

   A. Simple (Transparencies 1 and 2)

      1. Pig
      2. Horse
      3. Chicken
      4. Rabbit
      5. Man
      6. Dog

   B. Compound (Transparency 3)

      1. Cow
      2. Sheep
      3. Goat

      (NOTE: Many texts refer to the horse as being complex)

V. Functions of hormones

   A. Digestion - Example: Pancreatic juice; produced by the pancreas

   B. Metabolism - Example: Thyroxine; produced by thyroid gland

   C. Milk secretion - Example: Lactogen; produced by the pituitary gland

   D. Let-down of milk - Example: Lactogen; produced by the pituitary gland

   E. Development of sexual characteristics - Example: Estrogen, progesterone; produced by the sex glands

VI. Digestive processes in mouth

   A. Chewing or grinding of feed

   B. Secretion of saliva

VII. Glands that aid in feed breakdown

   A. Thyroid - Secretes thyroxine

   B. Parathyroid - Concerned with calcium metabolism

   C. Pituitary - Secretes lactogen

   D. Adrenal - Secretes adrenaline

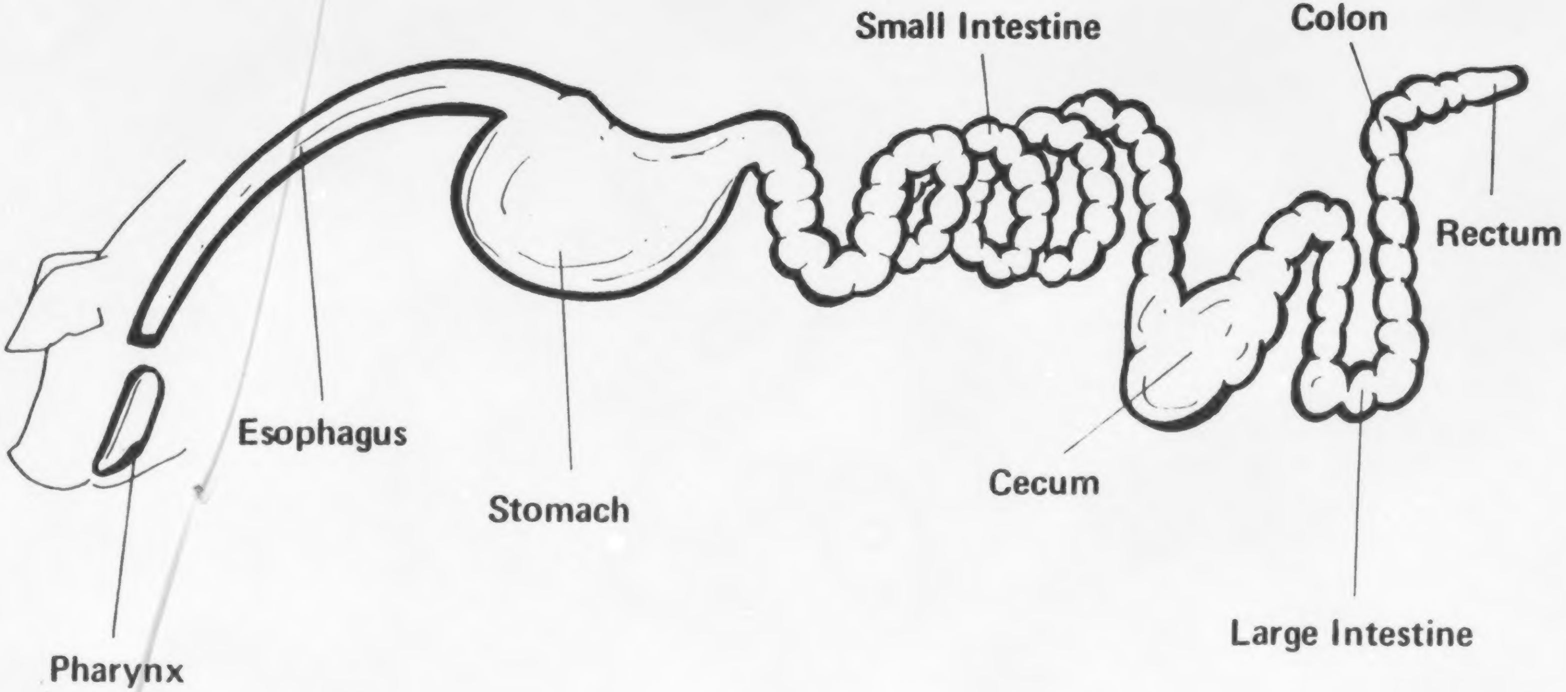
   E. Pancreas - Secretes pancreatic juice

   F. Liver - Secretes bile, which breaks down fats

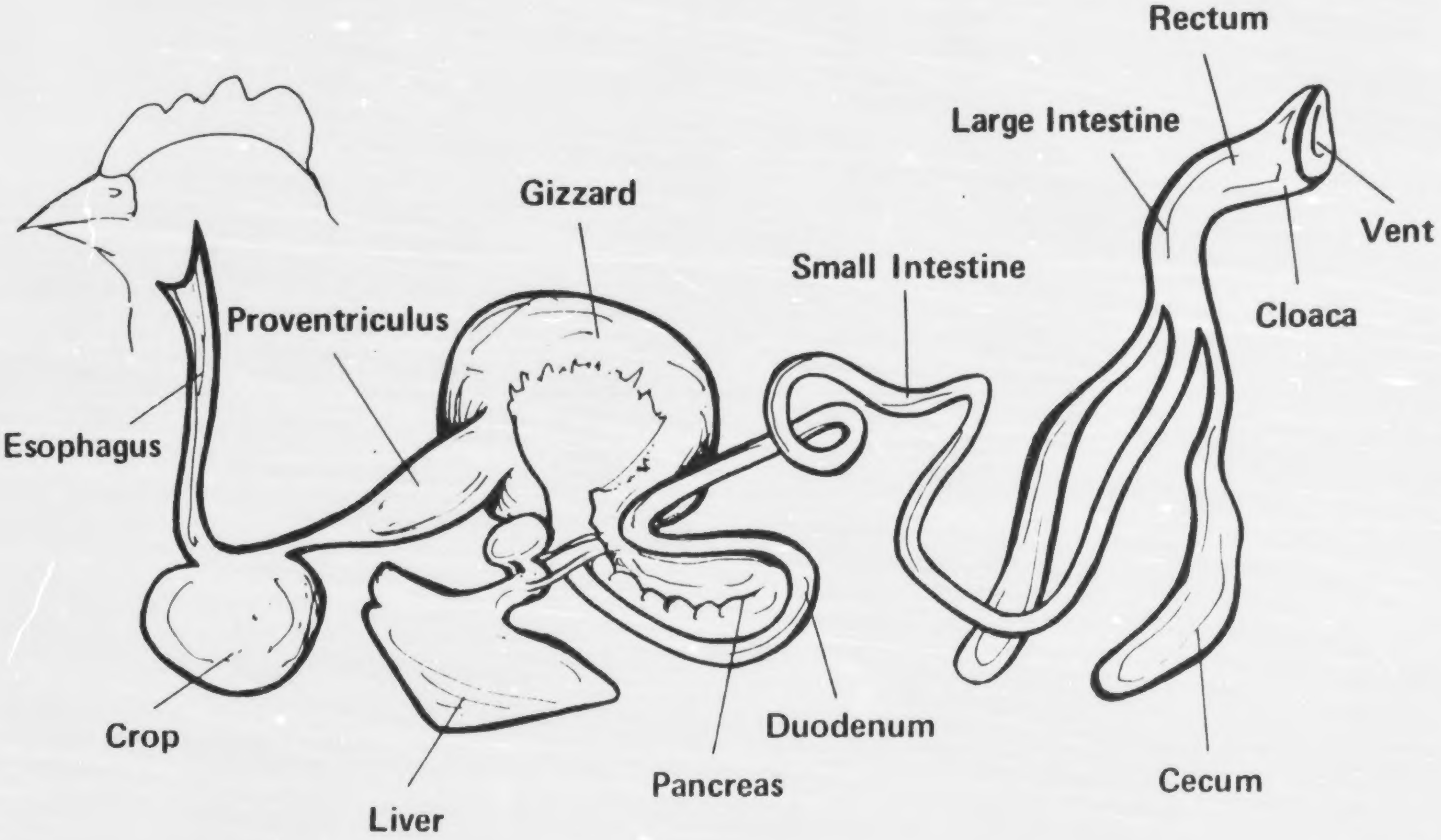
VIII. Types of digestion

- A. Chemical
  - 1. Saliva
  - 2. Juices
- B. Mechanical
  - 1. Chewing
  - 2. Grinding

Simple Digestive System of Swine


Small Intestine
Colon
Rectum
Esophagus
Stomach
Cecum
Pharynx
Large Intestine

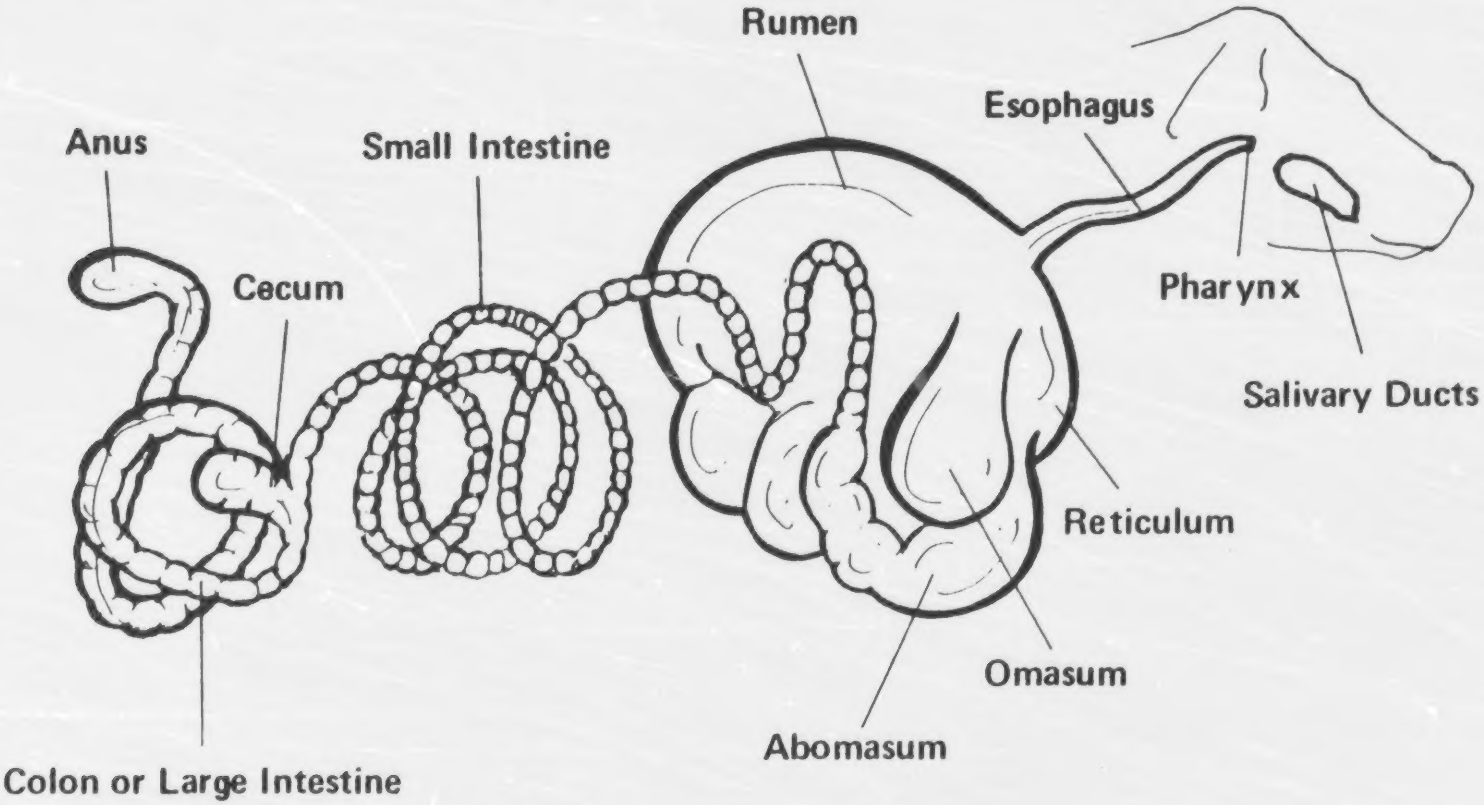
Simple Digestive System of the Chicken


Rectum
Large Intestine
Gizzard
Vent
Small Intestine
Proventriculus
Cloaca
Esophagus
Crop
Duodenum
Pancreas
Cecum
Liver

TM 2

Ag. II - 69-E

Compound Digestive System of the Cow

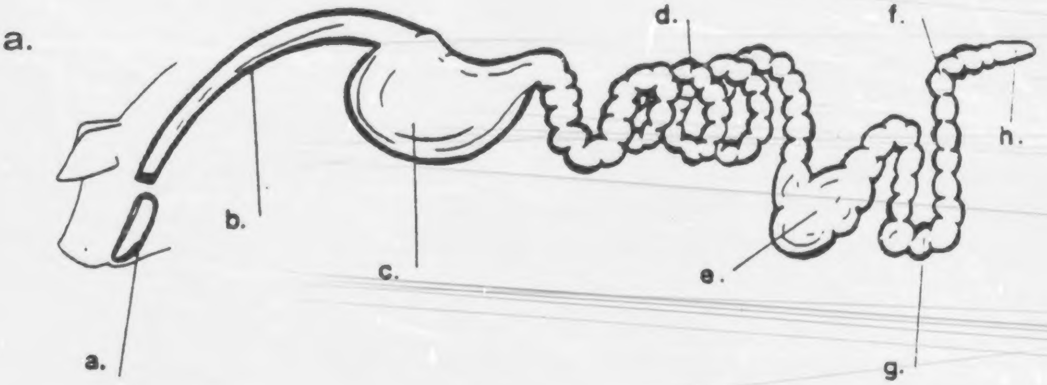

Rumen
Esophagus
Anus
Small Intestine
Cecum
Pharynx
Salivary Ducts
Reticulum
Omasum
Abomasum
Colon or Large Intestine

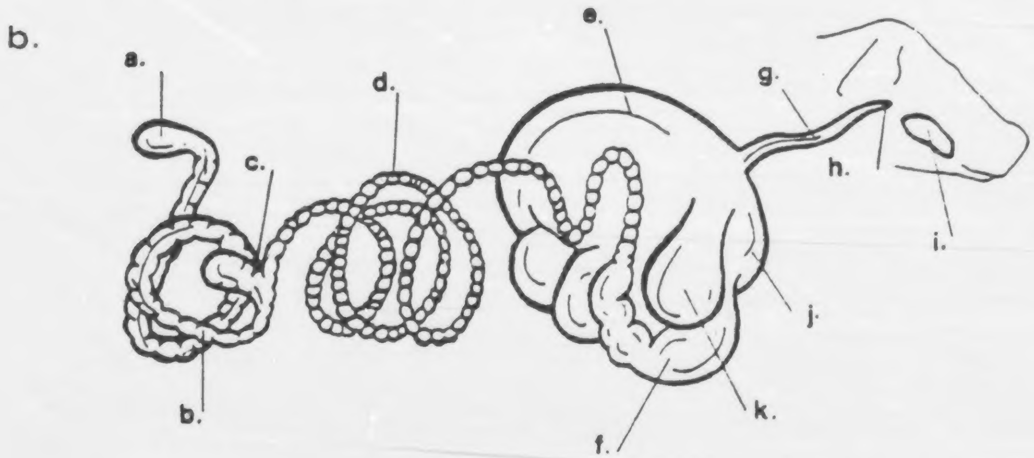
ANIMAL DIGESTION
UNIT III

TEST

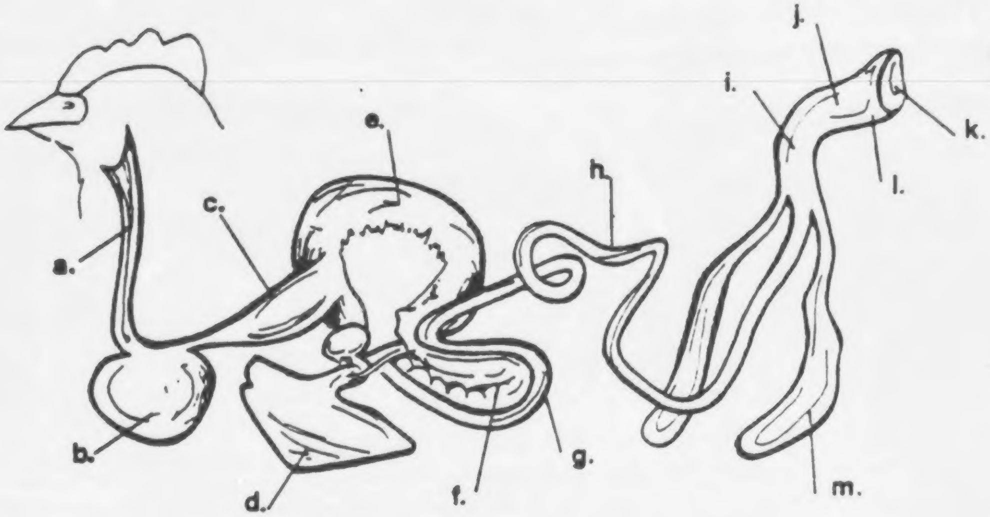
1. Define the following terms:
    a. Digestion -
    b. Mastication -
    c. Hormones -
    d. Feces -
    e. Metabolism -

2. Identify the parts of the following drawings.




b.
a.
b.
c.
d.
e.
f.
g.
h.
i.
j.
k.

C.


a.
b.
c.
d.
e.
f.
g.
h.
i.
j.
k.
l.
m.

Answers for question 2:

A. a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

f. ____________________

g. ____________________

h. ____________________

B. a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

f. ____________________

g. ____________________

h. ____________________

i. ____________________

j. ____________________

k. ____________________

C. a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

f. ____________________

g. ____________________

h. ____________________

i. ____________________

j. ____________________

k. ____________________

l. ____________________

m. ____________________

3. What is the difference between a simple and a compound stomach?

4. In the list below, place an "S" by the simple stomach and an "R" by the ruminant animal.

_____a. Horse
_____b. Cow
_____c. Pig
_____d. Sheep
_____e. Man
_____f. Goat
_____g. Chicken
_____h. Dog
_____i. Rabbit

5. What are three functions of hormones in the digestive process?

a.
b.
c.

6. Discuss in writing two digestive processes that take place in the mouth.

7. Name five glands that aid in the breakdown of feeds in digestion.

a.
b.
c.
d.
e.

8. a. Chewing and grinding of feed is considered to be ____________ digestion.

b. Mixing of feed with saliva and juices is considered to be ______________ digestion.

MAINTAINING ANIMAL HEALTH
UNIT IV

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to develop a plan for maintaining animal health. The student should be able to apply prevention measures in maintaining animal health for his or her own livestock. The student should score eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms related to animal health.
2. Name five items to include in a plan for maintaining animal health.
3. Name five signs of good animal health.
4. Name three signs of poor animal health.
5. Select the average temperature for livestock and poultry.
6. Name five factors that constitute a good disinfection program.
7. Match the type of injections with place of injection and identify the point of injection on an animal.

MAINTAINING ANIMAL HEALTH
UNIT IV

INFORMATION SHEET

I. Terms and definitions

A. Vaccination - An injection of some agent into an animal for the purpose of preventing disease

B. Vaccine - A preparation containing killed or live microorganisms that are given to the animal to produce an immunity to a particular disease

C. Disinfectant - A substance which destroys infective agents

D. Antiseptic - A substance that will inhibit the growth of microorganisms without destroying them

E. Injection - The placing of a vaccine or antibiotic into an animal's body

F. Serum - The watery portion of an animal's blood which will stop the action of an infectious agent

G. Syringe - An instrument used to make injections, consisting of plunger, barrel, and various types and sizes of needles

H. Antibody - Specific chemicals in the blood serum that kill disease causing organisms or so weaken them to make them ineffective

I. Phagocytes - White blood corpuscles that produce antibodies and antitoxins to fight disease

II. Animal health plan

A. Proper housing and ventilation

B. Proper manure disposal

C. Control of rodents and birds

D. Use of disinfectants

E. Proper carcass disposal

F. Proper isolation of new animals

G. Pasture rotation

H. Vaccination

I. Parasite control

III. Good signs of animal health
- A. Contentment
- B. Alertness
- C. Cudding by ruminants
- D. Sleek coat
- E. Bright eyes and pink eye membrane
- F. Normal feces and urine
- G. Normal temperature, pulse rate, and breathing rate

IV. Signs of poor animal health
- A. Loss of appetite
- B. Rough hair coat
- C. Abnormal feces
- D. Not ruminating
- E. Dull eyes
- F. High temperature
- G. Discolored urine

V. Rectal temperature

Animal	Degree F Average	Degree F Range
Cattle	101.5	100.4-102.8
Sheep	102.3	100.9-103.8
Goats	103.8	101.7-105.3
Swine	102.6	102.0-103.6
Horses	100.5	99.0-100.8
Poultry	106.0	105.0-107.0

VI. Effective disinfection

- A. Cleanliness of area before applying disinfectant
- B. Killing strength of the disinfectant
- C. Dilution at which the disinfectant is used
- D. Thoroughness of application

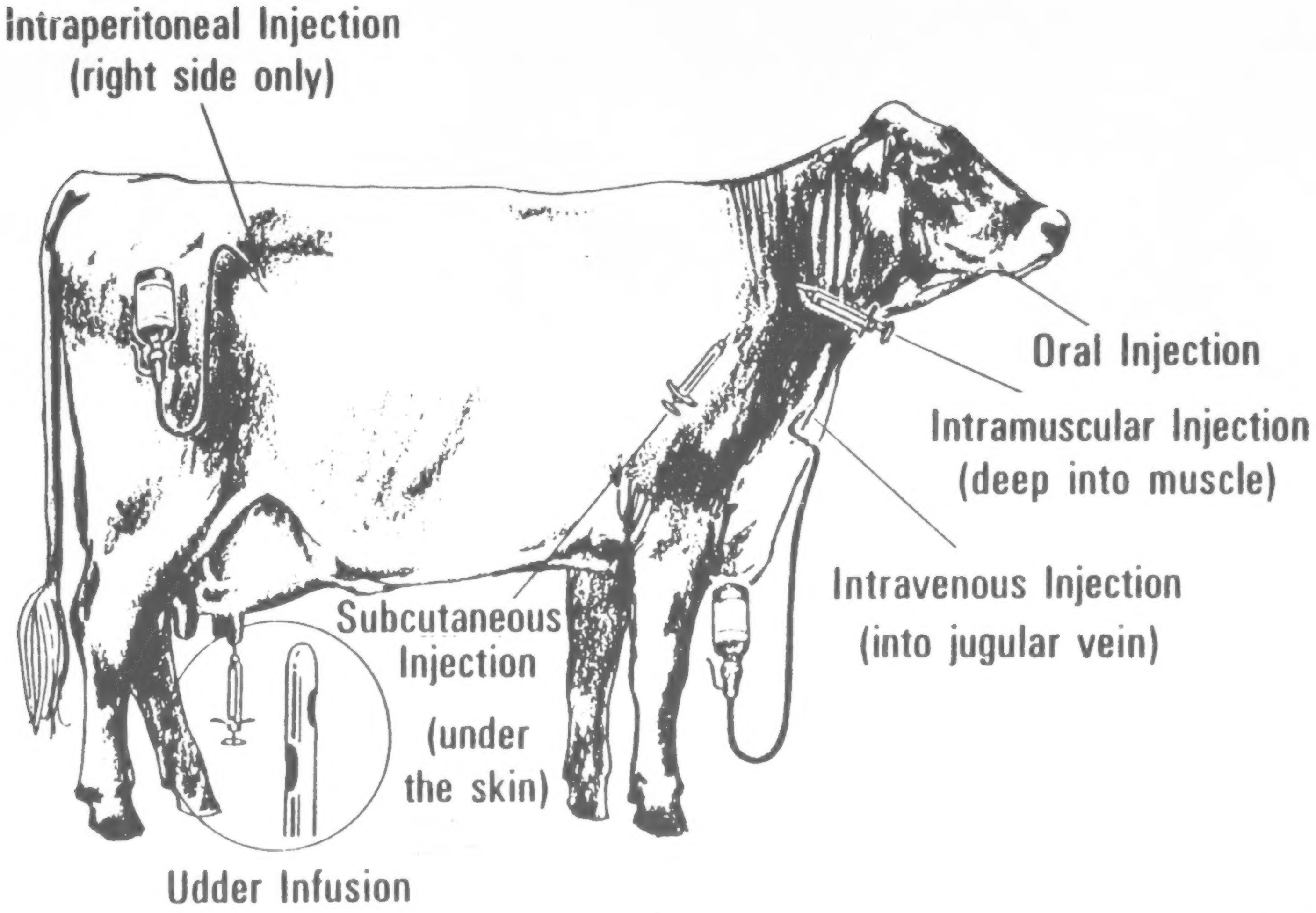
VII. Kinds of injections (Transparency 1)

- A. Subcutaneous - Injection placed under the skin
- B. Intravenous - Injection placed in a vein when fast action is wanted
- C. Intramuscular - Injection placed in the muscle, usually the thigh or neck
- D. Oral - Injection placed through the mouth into the stomach
- E. Intraperitoneal - Injection placed in the right side of the abdominal cavity
- F. Udder infusion - Injection placed in the udder

II. Regulative agencies for animal health

- A. Animal disease eradication division
- B. State veterinarians
- C. State sanitary commissions
- D. State agricultural boards

Injection Points


Intraperitoneal Injection
(right side only)
Oral Injection
Intramuscular Injection
(deep into muscle)
Intravenous Injection
(into jugular vein)
Subcutaneous
Injection
(under
the skin)
Udder Infusion

MAINTAINING ANIMAL HEALTH
UNIT IV

TEST

1. Match the definition with the proper health terms:

_____a. Vaccination
_____b. Disinfectant
_____c. Injection
_____d. Vaccine
_____e. Antiseptic

1. The placing of a vaccine or antibiotic into an animal's body
2. A substance that will inhibit the growth of microorganisms without destroying them
3. A preparation containing killed or live microorganisms that is given to the animal to produce an immunity to a particular disease
4. An injection of some agent into an animal for the purpose of preventing disease
5. A substance which destroys infective agents

2. What should be included in the development of an animal health plan?

a.
b.
c.
d.
e.

3. Name five signs of good animal health.

a.
b.
c.
d.
e.

4. Name three signs of poor animal health.

   a.

   b.

   c.

5. Select the proper temperature of each animal listed below.

_____a.	Swine	1. 103.8 Average Degree F
_____b.	Horses	2. 102.6 Average Degree F
_____c.	Sheep	3. 100.5 Average Degree F
_____d.	Cattle	4. 106.0 Average Degree F
_____e.	Poultry	5. 101.5 Average Degree F
_____f.	Goats	6. 102.3 Average Degree F

6. What factors influence the quality of a good disinfection program?

   a.

   b.

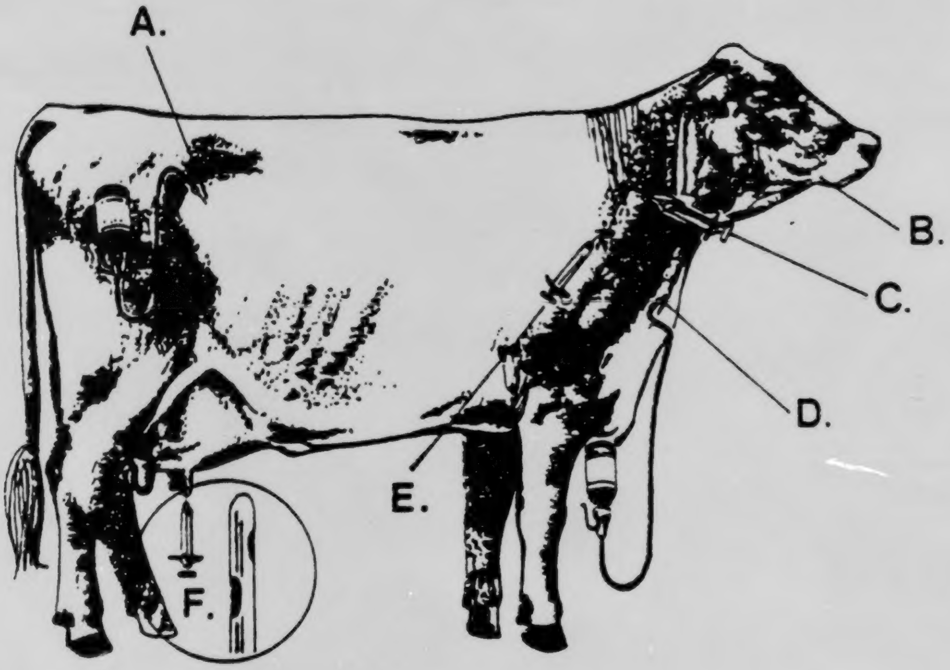
   c.

   d.

7. A. Match the following statements with the proper types of injections.

_____a.	Oral	1. Injection placed under skin
_____b.	Intramuscular	2. Injection placed through the mouth
_____c.	Subcutaneous	3. Injection placed in a vein
_____d.	Intravenous	4. Injection placed in a muscle
_____e.	Intraperitoneal	5. Injection placed in the abdominal cavity
_____f.	Udder	6. Injection placed in the udder

7. B. Identify the points of injections from the drawing below.



A.______________________________________

B.______________________________________

C.______________________________________

D.______________________________________

E.______________________________________

F.______________________________________

8. **List four agencies that regulate animal health.**

   a.

   b.

   c.

   d.

DISEASES
UNIT V

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinguish between infectious, non-infectious, and nutritional diseases. The student should be able to recognize various diseases and develop means of control and treatment. He should be able to relate this knowledge to his or her home farm and community. The student should score eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Write the definitions of five terms associated with livestock diseases.
2. Distinguish between infectious, non- infectious, and nutritional diseases.
3. Divide diseases into four groups - reproductive, calfhood, respiratory, and general.
4. Name three parts of a brucellosis eradication program.
5. Name four ways to control cholera.
6. List species affected by six diseases.
7. Recognize the symptoms of six diseases.
8. Apply treatment of and control for six diseases.
9. Name two ways that cattle may become infected with brucellosis.
10. List three ways that swine may become infected with cholera.

DISEASES
UNIT V

INFORMATION SHEET

I. Terms and definitions

   A. Disease - Any departure from a state of health

   B. Infectious disease - A disease of men or animals resulting from an infection

   C. Infection - The entry and development of a pathogen in or on the body of an animal

   D. Non-infectious disease - A disease of men or animals not due to and infection but resulting from physical or chemical agents or metabolic derangement

   E. Incidence of disease - The number of cases of a disease occuring during a prescribed time interval

   F. Prevalence of disease - The total number of cases of a disease at a particular time

   G. Symptom - Any observable sign or evidence of disease

   H. Pathogen - Any disease-producing organism

   I. Bacteria - Micro-organisms whose bodies are made up of only one cell; they make up a large portion of microscopic life. Cause diseases such as pneumonia, tetanus, and tuberculosis

   J. Viruses - Extremely small micro-organisms that can live and multiply within living cells, thus they cannot be killed by antibiotics. Cause diseases such as foot and mouth disease, hog cholera, and rabies

   K. Protozoa - Micro-organisms whose bodies are made up of a single cell but are 50 to 100 times larger than bacteria

   L. Incubation period - The period between the exposure to the disease agent and the appearance of the first symptoms or signs of the disease

   M. Carrier of disease - An animal which harbors in his body the specific organisms of a disease without obvious symptoms

   N. Vehicle of disease - Any medium by which a disease agent may be spread

   O. Abortion - The expulsion of a dead or immature fetus

II. Animal Diseases

A. Infectious diseases

1. Brucellosis - An infectious type of abortion caused by an organism known as brucella species
2. Leptospirosis - An infectious disease causing abortion
3. Vibriosis - A disease of the reproductive tract of cattle and sheep which is characterized by abortion
4. Trichomoniasis - A true veneral disease of cattle
5. Vaginitis - An infectious disease which localizes in the lining of the vagina
6. Blackleg - An acute disease that usually terminates fatally in twelve to thirty-six hours and principally attacks cattle between three and twenty-four months of age
7. Anaplasmosis - A serious blood disease of cattle caused by the biting insects
8. Foot rot - An infectious disease of the foot caused by a soil organism
9. Cancer eye - A tumor that is located on the eyelid or eyeball of cattle
10. Pinkeye - A very costly disease of cattle caused by glare, irritation, and bacteria
11. Milk fever - A disease caused by a lack of calcium in the blood stream
12. Erysipelas - A disease of swine produced by a micro-organism or bacteria similar to those which cause arthritis in some animals
13. Cholera - One of the most deadly diseases of swine caused by a small virus
14. Swine influenza - A virus infection of swine
15. Shipping fever - A virus infection of cattle resulting from stress
16. Pneumonia - A disease that causes inflammation of the lungs
17. Mastitis - An inflammation or irritation of the udder
18. Warts - A virus infection
19. Red nose - An infectious virus disease of cattle
20. Tuberculosis - A chronic infectious disease affecting cattle, sheep, and swine
21. Atrophic rhinitis - An infectious disease of swine which enters the body through wounds or scratches in the mouth or nose
22. Transmissible gastroenteritis - An infectious, destructive disease among young pigs

23. Sleeping sickness - A serious disease marked by fever, impaired vision, yawning, grinding of teeth, drowsiness, inability to swallow, inability to rise when down, paralysis and death
24. Rabies - An acute, often fatal virus disease at the central nervous system, occurring chiefly among carnivorous animals
25. Psuedorabies - An acute, fatal disease affecting cattle, sheep, and swine, marked by intense itching, drooling, fever, and coughing

B. Non-infectious diseases

1. Bloat - A digestive disorder of ruminants
2. Prussic acid - A poisoning received when cattle graze on frost or drought-damaged Johnsongrass

C. Nutritional diseases

1. Anemia - A nutritional deficiency disease
2. Founder - A nutritional ailment due to overeating or overdrinking
3. Rickets - A nutritional deficiency disease
4. Ketosis - A metabolic disorder thought to be a disturbance in the carbohydrate metabolism

III. Groups of diseases

A. Preproductive

1. Brucellosis
2. Leptospirosis
3. Vibriosis
4. Trichomoniasis
5. Vaginitis

B. Calfhood

1. Blackleg

C. Respiratory

1. Swine influenza
2. Shipping fever
3. Pneumonia
4. Red nose

D. General
    1. Foot rot
    2. Cancer eye
    3. Milk fever
    4. Erysipelas
    5. Cholera
    6. Mastitis
    7. Bloat
    8. Prussic acid
    9. Anemia
    10. Founder
    11. Rickets
    12. Pinkeye
    13. Anaplasmosis
    14. Warts
    15. Ketosis
    16. Transmissible gastroenteritis
    17. Tuberculosis
    18. Atrophic rhinitis

IV. Brucellosis eradication program
    A. Testing of all cows and heifers
    B. Removal of reactors from the herd
    C. Calfhood vaccination of all replacement heifers
    D. Retesting at regular intervals
    E. Isolation of all new animals purchased
    F. Testing of new animals before placing in herd

V. Cholera eradication program

- A. Phase four eradication program - States no vaccination of swine
- B. Cooking of garbage
- C. Prohibiting the use of (live) hog cholera virus
- D. Reporting of all cases of hog cholera

  (NOTE: This is a mandatory procedure introduced by the State Department of Agriculture.)
- E. Disposing of infected animals
- F. Cleaning and disinfection of infected herds
- G. Conforming to interstate and intrastate controls or movement of swine

VI, VII, VIII. Diseases: Species Affected, Symptoms, Treatment and Control

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Brucellosis	Cattle, sheep swine and men	Abortion; retained placenta; repeat breeders	Slaughter infected animals; calfhood vaccinate
Leptospirosis	Cattle, sheep, swine, and men	Abortion; loss of appetite; feverish; heavy breathing; bloody urine; calves may be born, but are weak, death may occur	Blood test; vaccinate all animals; isolate new animals
Vibriosis	Cattle and sheep	Abortion; low conception; temporary infertility	No treatment available; use antibiotics; sexual rest
Trichomoniasis	Cattle	Abortion; low conception; repeat breeding; inflammation of uterus	Sexual rest cows for 3 months after abortion; market infected bulls
Vaginitis	Cattle	Tissue of vagina reddish, roughened, and granular in appearance	Artifical insemination; purchase clean animals
Blackleg	Cattle; less frequently sheep	Sudden sickness or death; high fever; lameness; swelling of muscles; crackling sound may be heard when areas are touched	Burn or bury carcasses; vaccinate sheep 2-4 weeks before shearing, castrating, and docking

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONT[illegible]
Anaplasmosis	Cattle; sheep to lesser extent	Animals become weak and lag behind herd; skin becomes pale around eyes, on the muzzle, lips, and teats, and then turns yellow	Vaccinate all animals; keep animals from brushy areas; control flies, ticks, and mosquitoes
Foot rot	Cattle and sheep	Lameness; reddening and swelling of skin above hoof between toes	Move animal to dry quarters; trim inflamed foot and wash with warm soapy water; sulfa drugs and antibiotics are effective in treating
Cancer eye	Cattle	A small tumor on eyelid or eyeball; irritation around eye	Early diagnosis followed by surgery; slaughter
Pinkeye	Cattle and sheep	Watering and squinting of eyelid; severe reddening of membrane	Isolate affected animals; use antibiotis for control
Milk fever	Cattle, sheep, and swine	Occurs soon after giving birth; loss of appetite; constipation; nervousness; head usually turned back	Keep good supply of vitamins and minerals available; treat with an injection of calcium intravenously

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Erysipelas	Swine	Purple patches under belly; stiff, swollen knees and hocks	Isolate all sick animals; clean and disinfect pens; vaccinate once or twice a year; use antibiotics for control
Cholera	Swine	Sudden onset; fever; loss of appetite; weakness; drinking considerable water; belly may be purplish-red color; coughing is often evident	Quarantine; isolate; destroy and render
Swine influenza	Swine	Loss of appetite; become distressed; difficult breathing; discharge from eyes; cough is deep and loud; high fever for a few days	Provide warm, clean, well-ventilated quarters; ample supply of fresh water; use of antibiotics
Shipping fever	Cattle, sheep, and swine	High fever; discharge from eyes; hacking cough; difficult breathing; sometimes swelling in region of neck	Provide good feeding and management; vaccinate 3 weeks before stressing cattle
Pneumonia	Cattle, sheep, and swine	High fever; quick, shallow breathing; loss of appetite; crackling noise with breathing; discharge from nose	Isolate sick animals; practice good, sound husbandry; use sulfa drugs and antibiotics

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Mastitis	Cattle, sheep, and swine	Acute: udder becomes hot, very hard, and tender, increase in temperature; milk flow reduced and watery Chronic: milk thick or lumpy Sheep: discharge from teats or gangrene (blue bag)	Eliminate source of udder injury; provide clean bedding; use antibiotics
Warts	Cattle	Growths on the skin varying from very small to large, appearing around teats and head	Isolate cattle; clean and disinfect pens; vaccinate cattle to remove warts; paint infested area with tincture of iodine
Bloat	Cattle and sheep	Enlarged paunch noticeable on the left side	Keep animals on feet and moving; use stomach pump; feed dry hay before turning in to green lush pasture
Prussic acid	Cattle	Staggered walking; animals will go down quickly	Keep cattle from grazing frost or drought-damaged Johnsongrass or sudangrass; prompt treatment will result using nitrate boluses
Anemia	Cattle, sheep, and swine	Loss of appetite; slow and inefficient gains; death	Provide adequate amounts of nutrients; vaccinate suckling pigs

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Founder	Cattle and sheep	Extreme pain; high fever; dropping of hoof soles; turing up of toe walls	Avoid overfeeding of the animal; severe cases should be destroyed
Rickets	Cattle, sheep, and swine	Enlargement of the knee and hock joints; bowed legs	Provide sufficient calcuim, phosphorous, and vitamin D
Red nose	Cattle	Cough; loss of appetite; loss of weight; nasal discharge; rapid breathing; high fever	Vaccine available; practice good sanitation
Ketosis	Cattle and sheep	Cows: Loss of weight and appetite; decline in milk production Sheep: Weakness; frequent urination; trembles when exercised; death usually occurs in 90% of the cases	Glucose injection; feed well-balanced ration; add molasses ration
Transmissible gastroenteritis	Swine	Scouring and vomiting; disease spreads rapidly	No effective treatment available; practice good sanitation;move farrowing grounds

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Tuberculosis	Cattle, sheep, and swine	Very few symptoms; coughing; labored breathing	Practice good sanitation; test and slaughter reactor animal
Atrophic rhinitis	Swine	Starts with baby pigs; show signs of sneezing; snout twisted or distorted	Select replacements from clean herd; slaughter infected animals
Sleeping sickness	All mammals	Fever; impaired vision; irregular gait; yawning; drowsiness	Annual vaccination; no specific agent is available for treatment
Rabies	All warm blooded animals and man	Furious form; loss of appetite; cessation of milk secretion; madness; inability to swallow; butting of the head; posterior paralysis on 4th or 5th day; followed by coma and death on about the 6th day	After disease if fully developed, there is no known cure

IX. Causes of the spreading of brucellosis
   A. Purchase of infected animals
   B. Contact with infected animals over fence lines
   C. Exposure at livestock shows
   D. Livestock trucks and trailers
   E. Public livestock auctions
   F. Aborted calves not disposed of properly

X. Causes of the spreading of cholera
   A. Feed contaminated with urine
   B. Mouth and nose secretions
   C. Drinking unclean water
   D. Garbage feeding

DISEASES
UNIT V

TEST

1. Define the following terms:
    a. Incubation period -
    b. Infection -
    c. Disease -
    d. Symptom -
    e. Abortion -

2. Match the disease with the correct definition.

_____a. A serious blood disease of cattle caused by biting insects

_____b. An infectious disease of the foot caused by a soil organism

_____c. An infectious type of abortion caused by an organism known as brucella species

_____d. A disease caused from a lack of calcium in the blood stream

_____e. One of the most deadly diseases of swine caused by a small virus

_____f. An inflammation or irritation of the udder

_____g. A digestive disorder of ruminants

1. Mastitis
2. Cholera
3. Bloat
4. Milk fever
5. Anaplasmosis
6. Brucellosis
7. Foot rot

3. Divide the diseases listed below into groups according to reproductive, calfhood, respiratory, and general. Use the following letters to represent each group of diseases: Rp-Reproductive; C-Calfhood; R-Respiratory; and G-General.

_____a. Foot rot
_____b. Leptospirosis
_____c. Blackleg
_____d. Swine influenza
_____e. Cholera
_____f. Brucellosis
_____g. Milk fever
_____h. Pneumonia

4. Name three parts of a brucellosis eradication program.
   a.
   b.
   c.

5. Name three ways to control hog cholera.
   a.
   b.
   c.

6. Complete the following chart showing species affected, symptoms, and treatment and control for each disease.

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Brucellosis			
Cholera			
Anaplasmosis			

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Pneumonia			
Erysipelas			
Pinkeye			

7. Name two ways cattle may become infected with brucellosis.

   a.

   b.

8. List three ways that swine may become infected with cholera.

   a.

   b.

   c.

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Pneumonia			
Erysipelas			
Pinkeye			

7. Name two ways cattle may become infected with brucellosis.

   a.

   b.

8. List three ways that swine may become infected with cholera.

   a.

   b.

   c.

PARASITES
UNIT VI

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinquish between external and internal parasites. The student should be able to develop a plan for preventing parasites and be able to recognize the life cycle of parasites and develop means of control. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with parasites.
2. Name five methods and means of preventing external and internal parasites.
3. Divide ten parasites into two groups according to external and internal classifications.
4. Identify seven external parasites when given a drawing showing the parasites.
5. Label a drawing showing the life cycle of the cattle grub.
6. Reproduce the life cycle of the swine large intestinal roundworm.
7. Interpret the life cycle of the horn fly when given a drawing illustrating the cycle.
8. Complete a chart giving information of five parasites, telling animals affected, symptoms, prevention, and control.

PARASITES

INFORMATION SHEET

I. Terms and definitions

A. Parasite - An organism that lives on and gets its food from some other plant or animal

B. Life cycle - The series of changes through which an organism passes

C. Metamorphosis - A change in the form of structure of an animal occuring subsequent of birth or hatching

D. External parasites - One that lives on or under the skin

E. Internal parasite - One that lives within the organs of the body

F. Blowfly - A fly that breeds in necrotic animal flesh

G. Screwworm fly - A fly that raises its maggots in the open wounds of animals

H. Horn fly - A small blood sucking fly that spends it's resting time on the horns or back of cattle

I. Grubs - The maggot stage of honey-bee-like insects known as heel flies

J. Ringworm - A contagious disease of the outer layer of skin caused by certain microscopic molds and fungi

K. Lice - The small flattened wingless insect parasites

L. Horse fly - A large fly that transmits anaplasmosis of cattle

M. Coccidiosis - A parasitic disease caused by protozoan organisms known as coccida

N. Intestinal worm - A long worm found in the stomach, small intestine, and colon

O. Lungworm - A white threadline worm 1½ to 3 inches long found in the trachea and bronchi of cattle

P. Ascarids - A yellowish or pinkish worm 8 to 15 inches long, almost the size of a lead pencil

Q. Tick - A blood-feeding parasite known to transmit some disease-bearing organisms from one animal to another

R. Insecticide - A chemical used to kill insects

S. Contact poison - A substance absorbed through the insect's skin or body wall which acts on the pest's nervous system

T. Stomach poison - The material which is eaten and digested by the insect

U. Systemic poison - A substance taken up by the plant which kills the insect when it eats that plant. Unharmful to plant.

II. Methods and means of preventing parasites
   A. Preventing external parasites
      1. Keep manure cleaned from barnyards to prevent fly breeding
      2. Spray livestock regularly
      3. Spray livestock housing
      4. Control grubs before they damage the hide
      5. Spray and isolate new animals
      6. Check livestock frequently
   B. Preventing internal parasites
      1. Practice pasture rotation
      2. Check animals regularly
      3. Treat animals showing signs of parasites
      4. Practice good lot sanitation
      5. Drain wet pasture sites
      6. Graze young aminals on clean pastures

III. External and internal parasites
   A. External
      1. Blow fly
      2. Horn fly
      3. Screwworm fly
      4. Heel fly
      5. Tick
      6. Lice
      7. Ringworm
   B. Internal
      1. Coccidiosis
      2. Intestinal worm
      3. Lungworm
      4. Ascarid
      5. Mites
      6. Liver fluke
      7. Stomach worm
      8. Tapeworm

IV. External parasites (Transparency 1)

V. Life cycle of the cattle grub (Transparency 2)

VI. Life cycle of the swine intestinal roundworm (Transparency 3)

VII. Life cycle of the horm fly (Transparency 4)

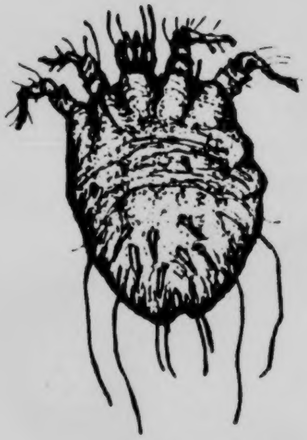
VIII. Parasites (Transparency 1)

A. External	Species Affected	Symptoms	Preventions and Controls
Blow Fly	Cattle, sheep, and swine	Infected wounds; soiled hair or fleece; animals become weak and fevered	Use proper procedures for destroying dead animals. Use traps, poisoned baits, and repellants
Horn Fly	Cattle	Cattle refuse to graze; seek protection by hiding in buildings, brush, or tall grass	Remove manure from around barn. Spray animals frequently from early May until frost. Use Methoychlor, Toxaphene, Malathion, Ronnel, Co-Ral
Screwworm Fly	Cattle, sheep and swine	Loss of appetite and poor condition	Branding, dehorning, and castrating during winter months. Keep property free of trash and report all cases to proper authority. Kill in larva stage. Use EQ 335 and Co-Ral.
Heel Fly	Cattle	Grub (larva) in back of cattle from December to May; swelling in backs of animals	Control flies between June and October. Use Co-Ral. Do not use after October 15.
Tick	Cattle, sheep, and swine	May cause anaplasmosis. Animals become weak, lose weight, and ears droop	Spray or dust frequently. Use Lindane, Toxaphene, and Malathion.
Lice	Cattle, sheep, and swine	Irritation, restlessness and loss of condition. Some lice cause animals to become anemic.	Spray frequently from October until spring. Use Tozaphene, Co-Ral, and Malathion.

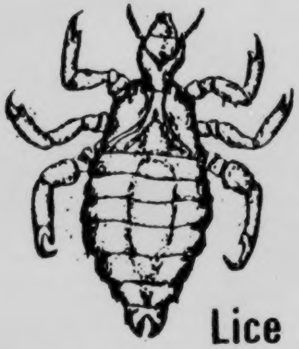
Ringworm	Cattle, sheep, and swine	Round, scaley areas around eyes, ears, and neck	Isolate affected animals, disinfect equipment, and practice strict sanitation. Apply iodine solution.
B. Internal	Species Affected	Symptoms	Preventions and Controls
Coccidiosis	Cattle, sheep, and swine	Diarrhea, bloody feces, and weakness	Avoid contaminated feed and water, isolate affected animals, and keep fedders and waterers sanitary. Consult veterinarian.
Intestinal Worm	Cattle, sheep, and swine	Loss of weight, poor rate of gain, anemia, and/or diarrhea	Rotate pastures, isolate calves and lambs from adult animals, and keep feeders and waterers sanitary. Use Phenothiazine.
Lungworm	Cattle, sheep, and swine	Coughing, labored breathing, and loss of appetite (Young animals become stunted and unthrifty)	Practice good sanitation. Do not spread infested manure on pasture. Use Dictycide.
Ascarid	Swine	Coughing and hard breathing (Young pigs become unthrifty and stunted; liver damage)	Clean farrowing quarters. Wash sows before farrowing, place sows and pigs on clean pasture after farrowing. Use Piperazine, sodium, and fluoride.
Mites	Cattle, sheep, and swine	Skin irritated; itching and scratching	Spraying and dipping. Use Lindane, lime-sulfur.
Liver Fluke	Cattle and sheep	Anemia, digestive disturbances, loss of weight	Avoid wet pastures. Use a good drench---Hexachlorethane - Bentonite mixture.

Stomach Worm	Sheep	No specific symptoms	Pasture rotation. Drench with Phenothiazine.
Tapeworm	Cattle, sheep, and swine	No specific symptoms	Pasture rotation. Use copper sulfate-nicotine sulfate.

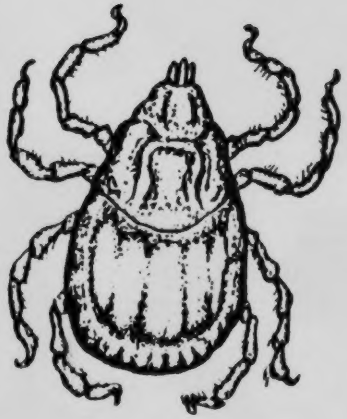
External Parasites



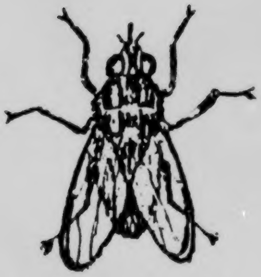
Mite



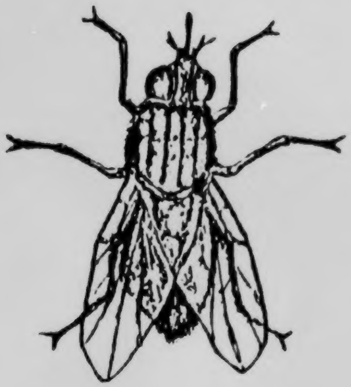
Lice



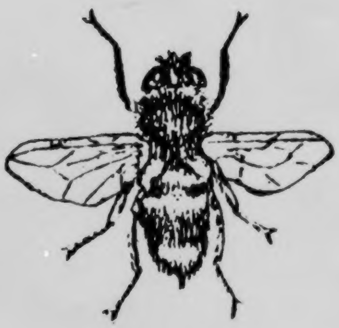
Tick



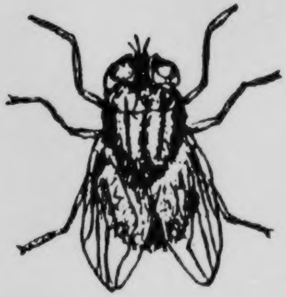
Horn Fly



Barn Fly

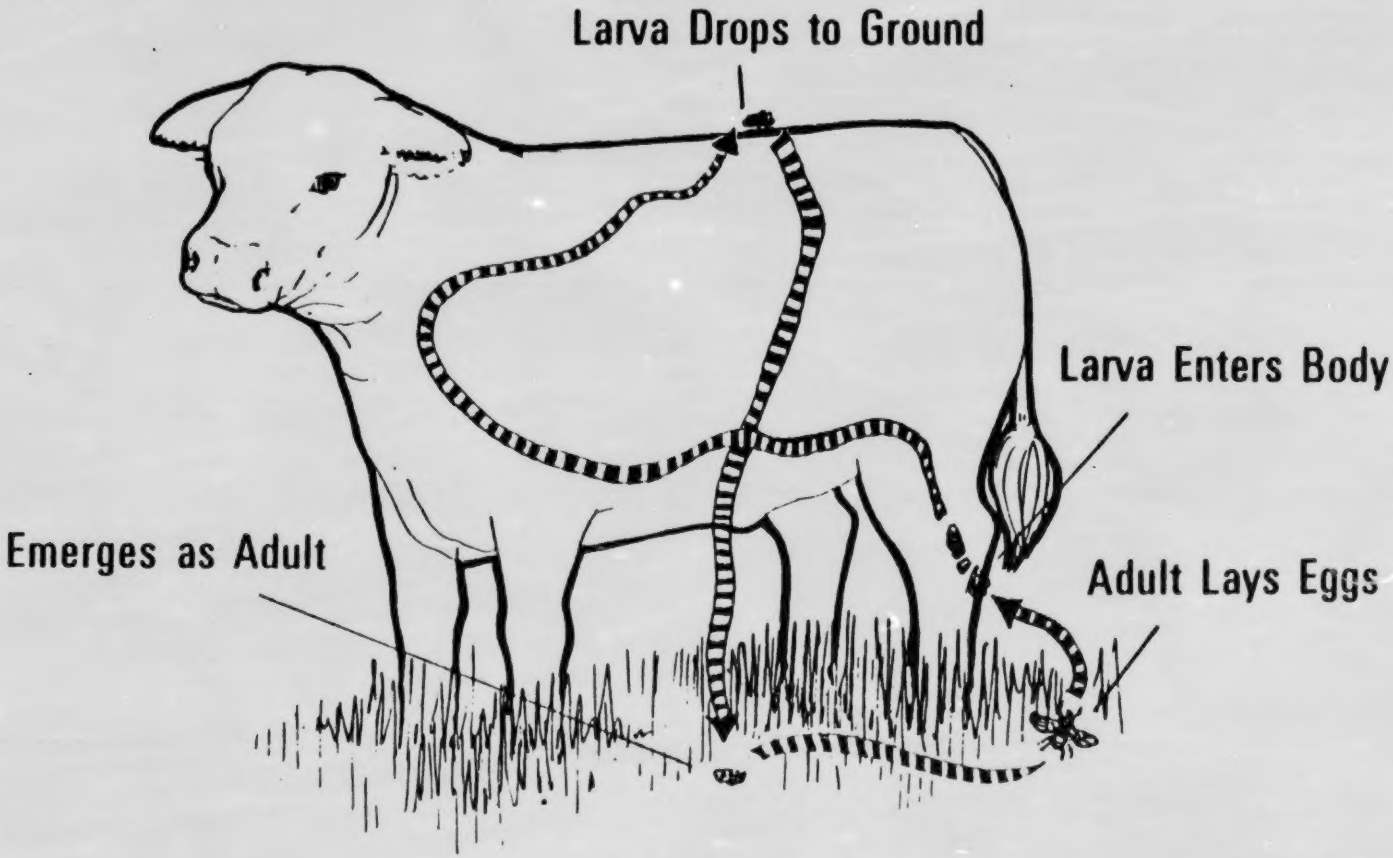


Heel Fly



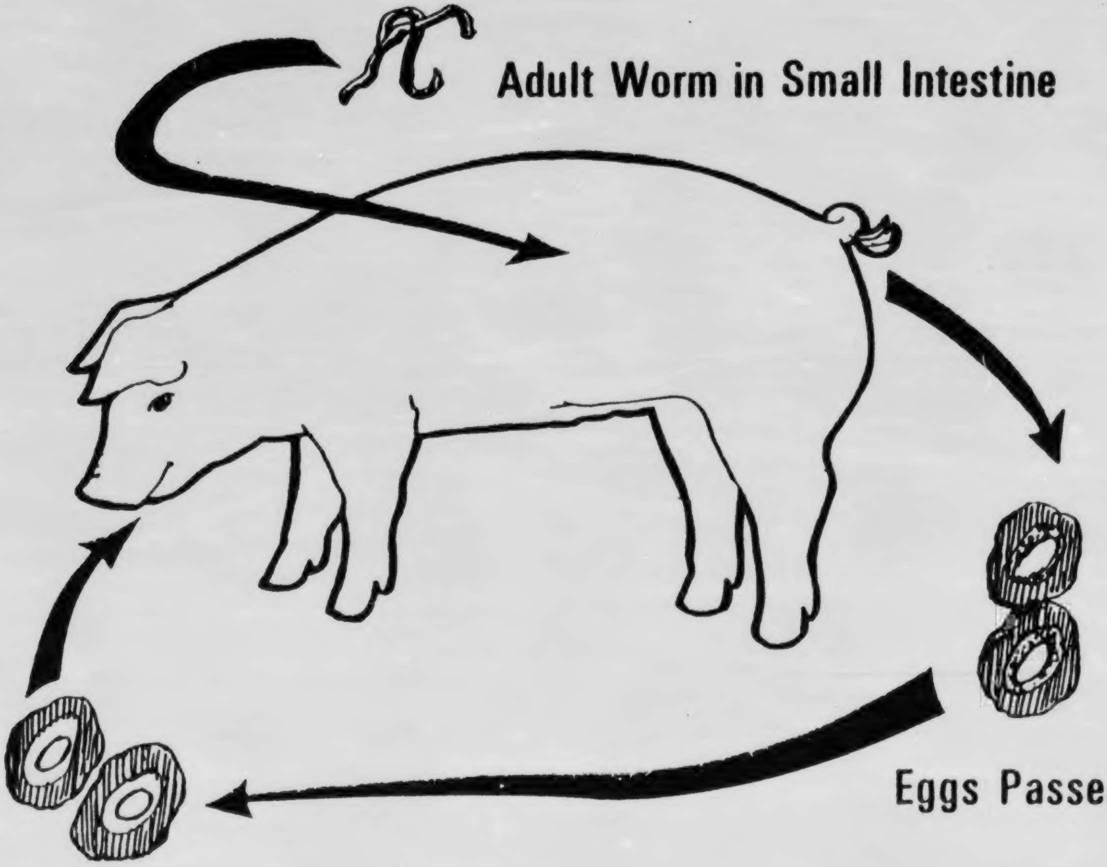
Screwworm Fly

Life Cycle of the Cattle Grub


Larva Drops to Ground
Larva Enters Body
Emerges as Adult
Adult Lays Eggs

Ag. II - 131-E

Life Cycle of the Swine Intestinal Roundworm

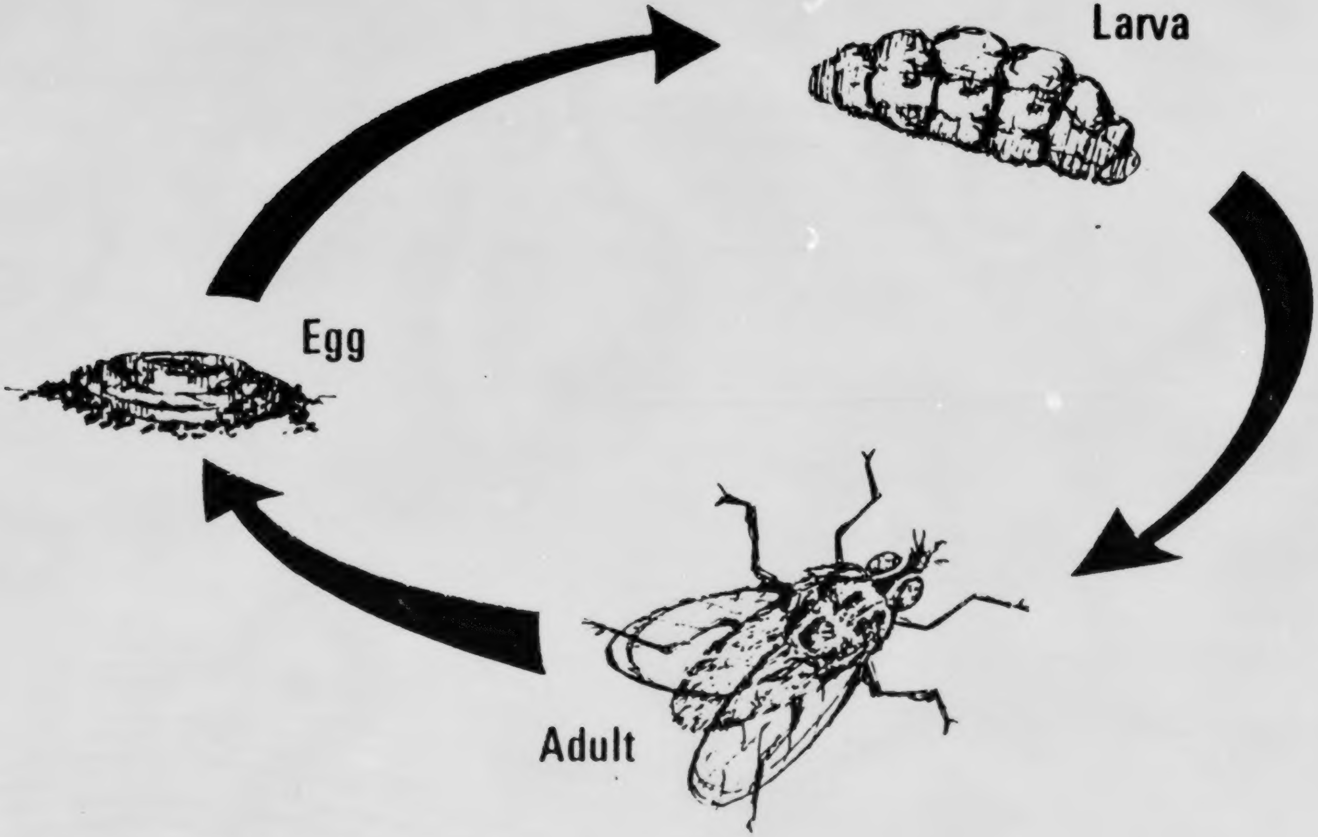


Adult Worm in Small Intestine

Eggs Passed in Feces

Eggs Eaten by Swine

Life Cycle of the Horn Fly


Larva
Egg
Adult

PARASITES
UNIT VI

TEST

1. Define the following terms:
   - a. Parasite -
   - b. Coccidiosis -
   - c. Tick -
   - d. External parasite -
   - e. Internal parasite -

2. A. Name five methods of preventing internal parasites.
   1.
   2.
   3.
   4.
   5.

   B. Name five methods of preventing external parasites.
   1.
   2.
   3.
   4.
   5.

3. From this group of parasites, divide them into external and internal. Place an "E" in the blank before an external parasite and an "I" before an internal parasite.

_____a. Horn fly

_____b. Coccidiosis

_____c. Blow fly

_____d. Horse fly

_____e. Grub

_____f. Lungworm

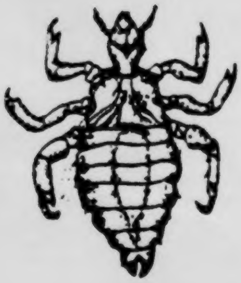
_____g. Lice

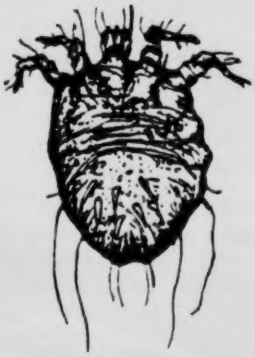
_____h. Tick

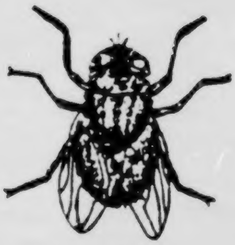
_____i. Intestinal worm

_____j. Screwworm fly

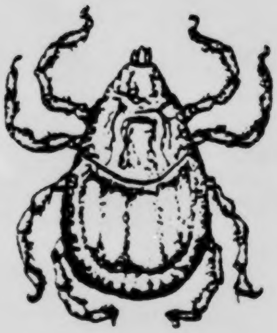
4. Identify the following:

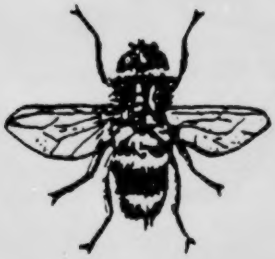


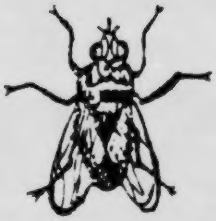




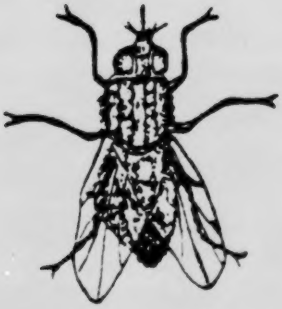
A.__________________ B.__________________ C.__________________





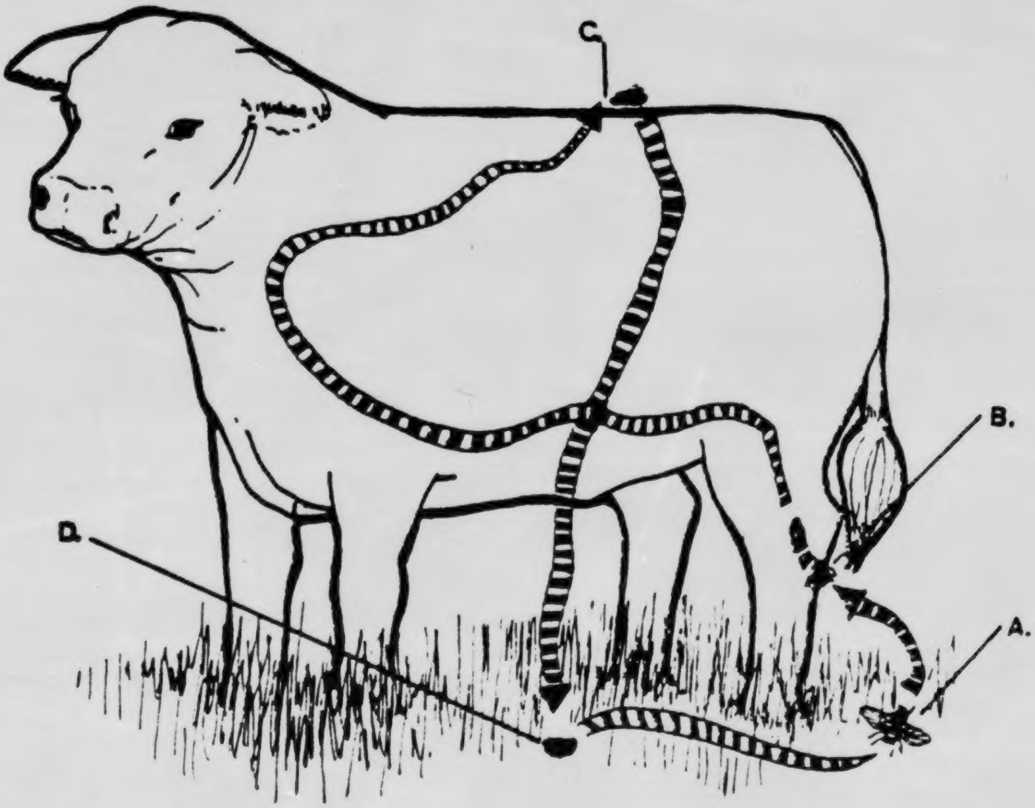


D.__________________ E.__________________ F.__________________



G.__________________

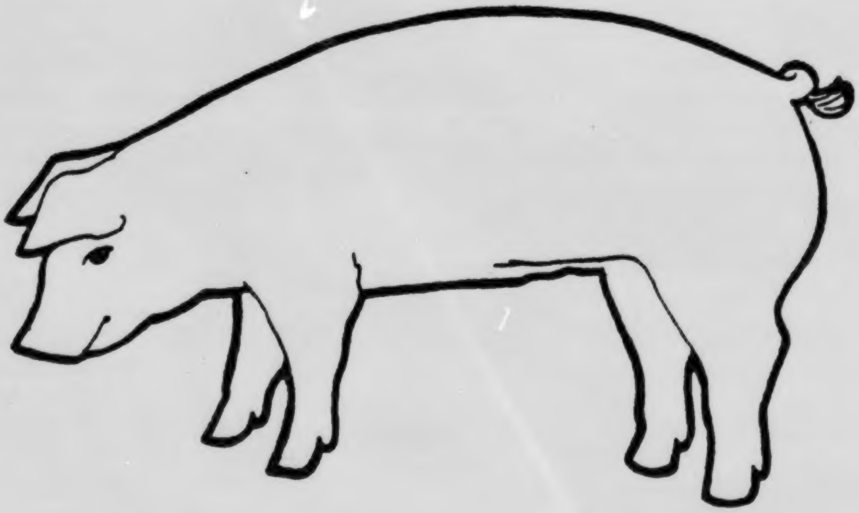
5. Label the drawing below showing the life cycle of the cattle grub.



A. ______________________ C. ______________________

B. ______________________ D. ______________________

6. Draw the cycle of the Swine Large Intestinal Roundworm.



7. **Name the changes in the life cycle of the horn fly.**

   a.

   b.

   c.

8. **Complete the following chart:**

Parasite	**Species Affected**	**Symptoms**	**Prevention and Control**
Tick			
Lungworm			
Heel Fly			
Horse Fly			
Lice			

DAIRY PRODUCTS
UNIT VII

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinguish the odor and flavor of milk and cottage cheese, identify cheeses, score sediment filters, and name selected references for milk production and marketing.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Name the undesirable factors on milker head units.
2. Discuss milk sediment scoring.
3. Name the six factors that cause off flavors of milk.
4. Identify the defects of milk by flavors.
5. Identify the defects of cottage cheese by flavor.
6. Describe the desirable cottage cheese flavor.
7. Name the federal and state standards used in making safe cheeses.
8. Identify the different samples of cheeses.
9. Demonstrate the ability to score milk flavors, milk sediment filters, cheese flavors and odors, and milker units.

DAIRY PRODUCTS
UNIT VII

INFORMATION SHEET

I. Undesirable factors on milker head units

  A. Undesirable factors (Rubber) -

    1. Dirty or milkstone inside
    2. Checked or blistered
    3. Absorbed fat
    4. Leaky
    5. Poorly fitted

  B. Undesirable factors (Metal) -

    1. Dirty or milkstone inside
    2. Badly dented or damaged
    3. Pitted or corroded
    4. Open seam
    5. Exposed copper or brass

  (NOTE: A combination of any of the above factors may occur.)

II. Milk Sediment Scoring

(NOTE: The student should be able to score sediment discs according to the "United Sates Department of Agriculture Sediment Standards for Milk and Milk Products." Score whole points only.)

  A. The sediment disc represents the sediment on one pint of milk taken from a well mixed sample and run through a sediment tester fitted with an orifice measuring 0.40 inches in diameter.

  B. Score sediment discs as follows:

Degree of Sediment	Score
0 mg sediment	10
More than 0 mg, but not more than .5 mg	5
More than .5 mg, but not more than 1.5 mg	3
More than 1.5 mg, but not more than 2.5 mg	1
More than 2.5 mg	0

III. Causes of off flavors in milk

A. Feed-bacteria count may be low; flavor present when milk is drawn; usually more intense in nights milk; usually present when cows have had access to roughage shortly before milking

B. Absorption

1. Direct - Encountered very rarely; results only after long exposure to very odoriferous atmosphere

2. Indirect - Bacteria count may be low; odor of milk suggests uncleanliness

C. Chemical Composition of milk - Composition of milk flavor defects is noticeable when the milk is first drawn, milk usually distinctly salty; inherent to individual animal rarely in mixed milk; defect more likely from animal advanced in lactation or with infected udder

D. Processing - Pasteurized "heated or modified cooked" flavor. Detectable immediately after processing; usually not very intense; tends to disappear during storage

E. Chemicals - Not present when milk is first drawn or immediately after pasteurization; develops readily at low temperature - below 40° F bacteria count low

1. Rancidity - In raw milk only; bitter, soapy flavor; defect more in cream than in milk and more intense in butter than in cream

2. Oxidized - Chiefly in pasteurized milk; papery; tallowy; odor somewhat like wet cardboard

3. Activated - In pasteurized milk exposed to light, suggest burn protein

F. Foreign Material - Defect present in freshly bottled milk; taints vary; may resemble brine, medicine, paint, fly spray, or any other strong substance with which the milk may have been contaminated

IV. Milk Flavors (Transparency 1)

A. Bitter

B. Feed

C. Flat/Watery

D. Foreign

E. Garlic/Onion

F. High Acid

G. Malty

H. Metallic/Oxidized

I. Musty

J. Rancid

K. Salty

L. Unclean

M. Weedy

N. No Defect

V. Cottage Cheese Flavors (Transparency 2)

A. Acid

B. Bitter

C. Coarse

D. Fermented/Fruity

E. Flat

F. Foreign

G. Garlic/Onion

H. Lacks Freshness

I. Malty

J. Metallic/Oxidized

K. Musty/Yeasty

L. Rancid

M. Salty

N. Unclean

O. No Defect

VI. Desirable cottage cheese flavors

A. Fresh, clean, pleasant, delicate-acid flavor that cleans up well after it has been eliminated from the mouth.

B. Determined by the characteristic flavor of the curd, the acidity of the curd, the volatile products formed by growth of the lactic acid organisms.

VII. Federal and state standards used in making cottage cheese

A. Made from sweet, pasteurized skim milk, concentrated skim milk, non-fat dry milk solids or mixtures of regular and reconstituted skim

B. Acid development is accomplished by the use of lactic starter or direct acid set

C. Rennet is permitted at the option of the manufacturer

D. The moisture content of the finished curd must not be more than 8%

E. 4% milk fat for creamed cottage cheese

VIII. Cheese Identification Chart

PART I

KIND	CLASSIFICATION	PLACE OF ORIGIN	KIND OF MILK USED	RIPENING OR CURING TIME	FLAVOR
BLUE (BLEU)	Mold Ripened	France	Cow's milk, whole	2 mo. minimum; 3-4 mo. average; 9 mo. pronounced flavor	Tangy, peppery, piquant spicy
ROQUEFORT (Rōk-fẽrt)	Mold Ripened	France	Sheep's milk	2 mo. minimum to 5 mo. or longer	Sharp, spicy piquant, slightly peppery
BRICK	Semisoft Ripened	U.S.A.	Cow's milk, whole	2 to 4 mo. or longer	Mild to moderately sharp
BRIE (BRẼ)	Soft Ripened	France	Cow's milk, whole	4-8 weeks	Mild to pungent
CHEDDAR	Firm Ripened	England	Cow's milk, whole	1 to 12 mo. or more	Mild to very sharp
COLBY	Firm Ripened	U.S.A.	Cow's milk, whole	1 to 3 mo.	Mild to mellow
CREAM	Soft	U.S.A.	Cream and Cow's milk, whole	Unripened	Mild, slightly acid

KIND	CLASSIFICATION	PLACE OF ORIGIN	KIND OF MILK USED	RIPENING OR CURING TIME	FLAVOR
EDAM (Edăm)	Firm Ripened	Netherland "Holland"	Cow's milk	2 to 3 mo. or longer	Mild to mellow, nut like
GOUDA (Goú-dá)	Firm Ripened	Netherland "Holland"	Cow's milk, whole or partly skimmed	2 to 6 mo.	Mild to mellow, nut like
MONTEREY (JACK)	Firm Ripened	U.S.A.	Cow's milk, whole	2 to 6 weeks;	Mild
MOZZARELLA (Mŏ-tsa-rel′ la)	Firm Unripened	Italy	Cow's milk, whole or partly skimmed	Unripened	Mild, delicate
MUENSTER (Mun′ster)	Semisoft Ripened	Germany	Cow's milk	1 to 8 weeks	Mild to mellow, between brick and Limburger
RICOTTA	Soft Unripened	Italy	Whey & whole or skimmed milk, or whole or partly skimmed milk	Unripened	Bland but semi-sweet

KIND	CLASSIFICATION	PLACE OF ORIGIN	KIND OF MILK USED	RIPENING OR CURING TIME	FLAVOR
PROVOLONE (Prō-vō-lō´nĕ)	Firm Ripened	Italy	Cow's milk, whole	2 to 12 mo. or more	Mellow to sharp, smoky, salty
SWISS	Firm Ripened	Switzerland	Cow's milk, partly skimmed	2 to 9 mo. or longer	Sweet, nut like

PART II

KIND	BODY & TEXTURE	COLOR	SHAPE	USES
BLUE (BLEU)	Semisoft, pasty, sometimes crumbly	White, marbled with blue-green mold	Cylindrical	Appetizers, salads, dips, salad dressing, sandwich spreads, good with crackers
ROQUEFORT (Rōk´-fĕrt)	Semisoft, pasty, sometimes crumbly	White, marbled with blue-green mold	Cylindrical	Appetizers, snacks, salads, dips, sandwich spreads, good with crackers
BRICK	Semisoft; smooth, waxy body, elastic; numerous small mechanical openings	Light yellow to orange-creamy	Brick shaped loaf	Appetizers, sandwiches, snacks, salads

KIND	BODY & TEXTURE	COLOR	SHAPE	USES
BRIE (BRẼ)	Soft, smooth when ripened; thin, edible crust	Whitish crust, creamy yellow interior	Circular, medium and small wheels	Appetizers, sandwiches, snacks, good with crackers and fruit
CHEDDAR	Hard, firm smooth body, some mechanical openings	Light yellow to orange, N.Y. white	Varied shapes and styles, with rind and rindless	Appetizers, sandwiches, sauces, grating and hot dishes
COLBY	Softer and more open than Cheddar	White, light yellow to orange	Cylindrical	Sandwiches, snacks, cheeseburgers
CREAM	Soft, smooth, buttery	White	Foil-wrapped in 3 to 8 oz packages	Salads, dips, sandwiches, snacks, cheese cake, desserts
EDAM (Édăm)	Hard type but softer than cheddar; more open; mealy body	Creamy yellow with red wax color	Cannonball shape, flattened top	Appetizers, snacks, salad, sandwiches, sauces, desserts
GOUDA (Goú-dá)	Hard type but softer than cheddar, more open, mealy body	Creamy yellow may/may not have red wax	Ball shaped with flattened top & bottom	Appetizers, snacks, salad, sandwiches, sauces, desserts
MONTEREY (JACK)	Semisoft, smooth, open texture	Creamy white	Cylindrical wheels	Sandwiches, snacks

KIND	BODY & TEXTURE	COLOR	SHAPE	USES
MOZZARELLA (Mŏ-tsa-rel'la)	Semisoft, slightly firm, plastic	Creamy white	Small round; rectangular & spherical	Snacks, cheeseburgres, cooking, pizza
MUENSTER (Mun'ster)	Semisoft, smooth waxy body-open texture	Creamy white interior; yellow tan or white surface	Circular cake, small wheels, and blocks	Appetizers, sandwiches, snacks, desserts
RICOTTA	Soft; moist and grainy, or dry	White	Packaged fresh in paper, plastic or metal containers, or dry for grating	In cooked foods, as seasoning when dried
PROVOLONE (Prō-vō-lō'nĕ)	Firm, smooth, hard, compact, flaky	Light creamy interior; light brown or golden yellow surface	Pear shaped, sausage and salami shaped, bound with cord	Appetizers, sandwiches, snacks, cooking and grating
SWISS	Firm, hard, smooth, with large round eyes	Light yellow	Rindless blocks and large wheels	Sandwiches, snacks, sauces, fondue, salads, cheeseburgers

MILK
FLAVOR SCORING GUIDE

Suggested flavor scores* for milk with designated intensities of flavor defects

Flavor Criticisms	Intensity of Defect		
	Slight	Definite	Pronounced**
Bitter	5	3	1
Feed	9	8	5
Flat/Watery	9	8	7
Foreign	5	3	1
Garlic/Onion	5	3	1
High Acid	3	1	--
Malty	5	3	1
Metallic/Oxidized	6	4	1
Musty	7	4	1
Rancid	4	1	--
Salty	8	6	4
Unclean	3	1	--
Weedy	9	4	1
No Defect	10		

*Range of score for each class of flavor quality for milk:

Excellent	10
Good	8-9
Fair	5-7
Poor	2-4
Unacceptable	1

**Dash (--) indicates product with the intensity of off flavor would be unsalable.

COTTAGE CHEESE
FLAVOR SCORING GUIDE

Suggested flavor scores* for cottage cheese with designed intensities of flavor defects

Flavor Criticisms	Intensity of Defect Slight	Definite	Pronounced
Acid	9	7	5
Bitter	7	5	1
Coarse	9	8	7
Fermented/Fruity	5	3	1
Flat	9	8	7
Foreign	7	4	1
Garlic/Onion	5	2	1
Lacks Freshness	8	5	1
Malty	6	4	1
Metallic/Oxidized	5	3	1
Musty/Yeasty	5	3	1
Rancid	4	2	1
Salty	9	8	7
Unclean	6	3	1
No Defect	10		

*Range of score for each class of flavor quality for cottage cheese:

Excellent	10
Good	8-9
Fair	5-7
Poor	4-2
Unacceptable	1

MILK QUALITY AND DAIRY FOODS CONTEST

Ag. II - 161-E

Contestant's Name ______________________ Contestant's No. __________

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted or the cheese variety observed and in proper sample column. Do NOT write in space indicating official score, grade difference and grade on defects.

Perfect Score	Defects	Sample Number 1	2	3	4	5	6	7	Total Grades
MILK FLAVOR AND ODOR	Contestant's Score	6	8						
	Official Score	2	10						
	Grade Difference	4	2						6
	Grade on Defects	2	0						2
No Defects 10 Points	1. Bitter	0							
	2. Flat/Watery								
	3. Feed	x							
	4. Foreign								
Range 1-10	5. Garlic/Onion								
	6. High Acid								
	7. Malty								
(Defects valued at 2 Points each)	8. Metallic/Oxidized								
	9. Rancid								
	10. Salty								
	11. Unclean								
	12. No Defect		xo						
MILK SEDIMENT 8 Points	Contestant's Score	4	8						
	Official Score	6	6						
	Grade Difference	2	2						4
	Sediment -- Score sediment discs according to the U.S. Department of Agriculture sediment standards for milk and milk products.								
IDENTIFICATION OF CHEESES	Varieties	1	2	3	4	5	6	7	
	Grade on Identification	2	0						2
	1. Blue								
	2. Brick								
	3. Brie/Camenbert	x							
(Incorrect Identification 2 Points each)	4. Cheddar (mild)	0							
	5. Cheddar (sharp)								
	6. Colby								
	7. Cream/Neufchatel								
	8. Edam/Gouda								
	9. Monterey (Jack)								
	10. Mozzarella/Pizza		xo						
	11. Munster								
	12. Processed American								
	13. Provolone								
	14. Swiss								
TEST SCORE	Test on milk production (Number wrong)								6
	CONTESTANT'S SCORE - PART I								20

EXAMPLE: As an aid to a better understanding of the scoring method used, two samples are scored on the card above: X indicates contestant's mark; 0 indicates official's mark.

MILK QUALITY AND DAIRY FOODS CONTEST

Ag. II - 163-E

Contestant's Name ______________________________ Contestant's No. __________

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. Do NOT write in space indicating official score, grade difference, grade on defects, rubber parts and metal parts.

Perfect Score	Defects	Sample Number 1	2	3	4	5	6	7	Total Grades
COTTAGE CHEESE FLAVOR AND ODOR	Contestant's Score	7	5						
	Official Score	4	6						
	Grade Difference	3	1						4
	Grade on Defects	0	2						2
No Defects 10 Points	1. Acid								
	2. Bitter	xo							
	3. Coarse								
	4. Fermented/Fruity		x						
Range 1-10	5. Flat								
	6. Foreign								
	7. Garlic/Onion								
	8. Lacks Freshness								
(Defects valued at 2 Points Each)	9. Malty								
	10. Metallic/Oxidized								
	11. Yeasty		o						
	12. Rancid								
	13. Salty								
	14. Unclean								
	15. No Defect								
MILKER UNIT	Contestant's Score	2	3						
	Official Score	2.5	3						
	Grade Difference	.5	0						0.5
No Defects 4 Points	Grade on Defects	1.5	0						1.5
	RUBBER PARTS								
	1. Dirty or Milkstone	xo							
	2. Checked or Blistered		xo						
(Defects valued at 0.5 Points Each)	3. Leaky	x							
	4. Poorly Fitted	o							
	METAL PARTS								
	5. Dirty or Milkstone	x							
	6. Badly Dented or Damaged		xo						
	7. Pitted or Corroded								
	8. Open Seams	xo							
TEST SCORE	Test on milk marketing	(Number wrong)							5
	CONTESTANTS'S SCORE - PART II								13

EXAMPLE: As an aid to a better understanding of the scoring method used, two samples are scored above: X indicates contestant's mark; O indicates official's mark.

DAIRY PRODUCTS
UNIT VII

TEST

1. Name the undesirable factors on milker head units.
   a.
      1.
      2.
      3.
      4.
      5.
   b.
      1.
      2.
      3.
      4.
      5.

2. Discuss milk sediment scoring.

3. Name the six factors that result in off flavors of milk - explain each.
   a.
   b.
   c.
   d.
   e.
   f.

4. Name the defects of milk by flavors.
   a.
   b.
   c.
   d.

WHOLESALE CUTS AND QUALITY GRADES OF
BEEF, PORK, AND LAMB
UNIT VIII

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to identify by labeling, the wholesale cuts of beef, pork, and lamb. The student should be able to distinguish between the different quality grades for beef, pork, and lamb. This knowledge will be evidenced by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define seven terms associated with the wholesale cuts and quality grades of beef, pork, and lamb carcasses.
2. Identify the wholesale cuts of beef from a drawing.
3. Match the degrees of marbling with the examples.
4. List the quality grades of beef.
5. Determine the quality grades of beef from a quality grading chart.
6. List the factors that determine yield grades.
7. Match the yield grades with the characteristics of the carcasses.
8. Identify the wholesale cuts of pork from a drawing.
9. Describe the quality grades for pork.
10. Identify the wholesale cuts of lamb from a drawing.
11. Rank in order of importance the quality grades for lamb.
12. Write the average dressing percentages for beef, pork, and lamb.

WHOLESALE CUTS AND QUALITY GRADES OF
BEEF, PORK, AND LAMB
UNIT VIII

INFORMATION SHEET

I. Terms and definitions

A. Wholesale cuts - the parts at which the carcass is separated for selling purposes

B. Retail cuts - those cuts of meat sold directly to the consumer market

C. Bone - item used in determining the age of a beef carcass as evidenced by the youthfulness or maturity as indicated by the chine bones

D. Chine bones - extensions of the thorasiac vertebrae, with cartilage appendages, which determine the age of the carcass. A is the youngest, E is the oldest

(NOTE: A pearly white cartilage and a white porous chine indicate youthfulness or A maturity, while a red cartilage and red bone indicate more mature carcasses or C, D, E maturity.)

E. Ossification - hardening of the cartilage which indicates maturity

F. Marbling - flecks of intramuscular fat throughout the lean which denotes tenderness

G. Dressing percentage - the weight of the hot carcass as compared to the live weight of the animal

H. Conformation - refers to the general build, form, shape, contour, or outline of the carcass

I. Finish - refers to the amount, quality and distribution of fat

J. Quality - refers to the eating quality of the meat as indicated by characteristics of the fat and lean tissue, bone and marbling

K. Feathering - the internal fat deposited between the ribs of the internal carcass. An abundance of feathering indicates an abundance of marbling

L. Cutability - the proportion of the carcass that is salable as trimmed retail cuts

M. Quality Grade - a standardized system of classifying carcasses according to maturity and marbling

N. Yield Grade - a uniform method of identifying quantity or cutability differences among beef carcasses

II. Whole Cuts of Beef (Transparency 1)

A. Forequarter:

1. Chuck - 25% of the carcass

2. Brisket - 4% of the carcass
3. Shank - 3% of the carcass
4. Plate - 7% of the carcass
5. Rib - 9% of the carcass

B. Hindquarter
   1. Loin - 19% of the carcass
   2. Round - 20% of the carcass
   3. Rump - 4% of the carcass
   4. Hind Shank - 2% of the carcass
   5. Flank - 5% of the carcass

C. Variety Cuts
   1. Kidney
   2. Heart 2% of the carcass
   3. Tongue
   4. Liver

III. Degrees of Marbling (Transparency 2)
   A. Abundant
   B. Moderately abundant
   C. Slightly abundant
   D. Moderate
   E. Modest
   F. Small
   G. Slight
   H. Traces
   I. Practically devoid

   (NOTE: The pictures of the degrees of marbling illustrate the lower limit of each degree of marbling.)

IV. Quality Grades for Beef
   A. Prime
   B. Choice
   C. Good
   D. Standard
   E. Utility
   F. Commercial

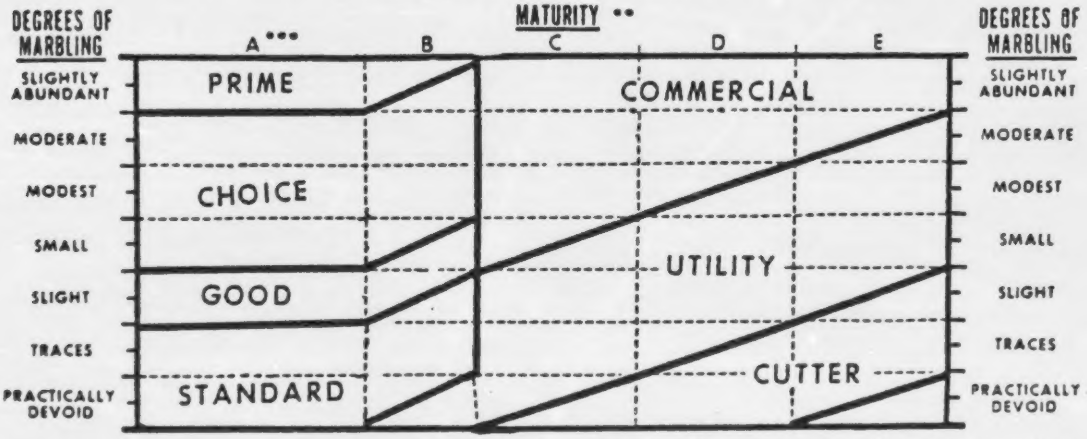
G. Cutter

H. Canner

V. Determining quality grades of beef

A. Quality grading chart (Transparency 3)

RELATIONSHIP BETWEEN MARBLING, MATURITY, AND CARCASS QUALITY GRADE *



*Assumes that firmness of lean is comparably developed with the degree of marbling and that the carcass is not a "dark cutter."
**Maturity increases from left to right (A through E).
***The A maturity portion of the Figure is the only portion applicable to bullock carcasses.

(NOTE: Quality grades are determined by two subjectively scored factors: maturity score and marbling score.)

B. Examples:

Degree of Marbling	Maturity	Carcass Quality Grade
1. Modest	C	Commercial
2. Traces	B	Standard
3. Moderate	A	Choice
4. Small	E	Utility

VI. Factors determining yield grades

- A. Carcass weight
- B. Rib eye area
- C. Internal fat percentage (kidney, pelvic, and heart fat)
- D. External fat over rib eye

VII. Yield grades and typical characteristics of carcasses

- A. 1 - Very trim, light weight, heavy muscled
- B. 2 - Trim, light weight, heavy muscled
- C. 3 - Average trimness, average weight, average muscling
- D. 4 - Wasty, heavy, average muscling
- E. 5 - Very wasty, heavy, poor to average muscling

VIII. Wholesale Cuts of Pork (Transparency 4)

The wholesale cuts of pork are:

1. Ham - 19% of the carcass
2. Loin - 15% of the carcass
3. Side - 17.5% of the carcass
4. Picnic shoulder - 8.5% of the carcass
5. Boston butt - 6.5% of the carcass
6. Jowl - 3% of the carcass

IX. Quality grades for pork

- A. Quality grades are based on:
  1. Carcass length
  2. Average backfat thickness
  3. Degree of muscling
     - a. degrees of muscling include:
       - 1) very thick
       - 2) thick
       - 3) moderately thick
       - 4) slightly thin
       - 5) thin
- B. The USDA pork grades include:
  1. U.S. No. 1
  2. U.S. No. 2

3. U.S. No. 3

4. U.S. No. 4

5. Utility

C. Pork grading chart

1. Relationship between average thickness of backfat, carcass length or weight, and grade for carcasses with muscling typical of their degree of fatness

a. An average of three measurements including the skin made opposite the first and last ribs and the last lumbar vertebra. It also reflects adjustment, as appropriate, to compensate for variations from - normal fat distribution

b. Carcass weight is based on a hot packer style carcass

c. Carcass length is measured from the anterior point of the aitch bone to the anterior edge of the first rib

X. Wholesale Cuts of Lamb (Transparency 5)

A. Hind saddle:

1. Leg - 33% of the carcass

2. Loin - 14% of the carcass

3. Flank - 3% of the carcass

B. Fore saddle:

1. Rack - 11% of the carcass

2. Square cut shoulder - 25% of the carcass

3. Breast - 14% of the carcass

(NOTE: The fore and hind saddle are separated between the 12th and 13th ribs.)

XI. Quality grades of lamb

A. The quality grades for lamb

1. Fat depostion

2. Conformation

3. Maturity (maturity is determined by break-joint)

B. The USDA lamb grades include:

1. Prime

2. Choice

3. Good

4. Utility

5. Cull

C. Grading chart for lamb:

GRADE	MATURITY	FAT DEPOSITION Feathering	 Flank	AVERAGE WEIGHT
Prime	A	Modest	Small	48 pounds
Choice	A-	Slight	Traces	45 pounds
Good	B-	Traces	Practically none	41 pounds
Utility	B-	Practically none	None	30 pounds
Cull	--	-----------	-----------	---------

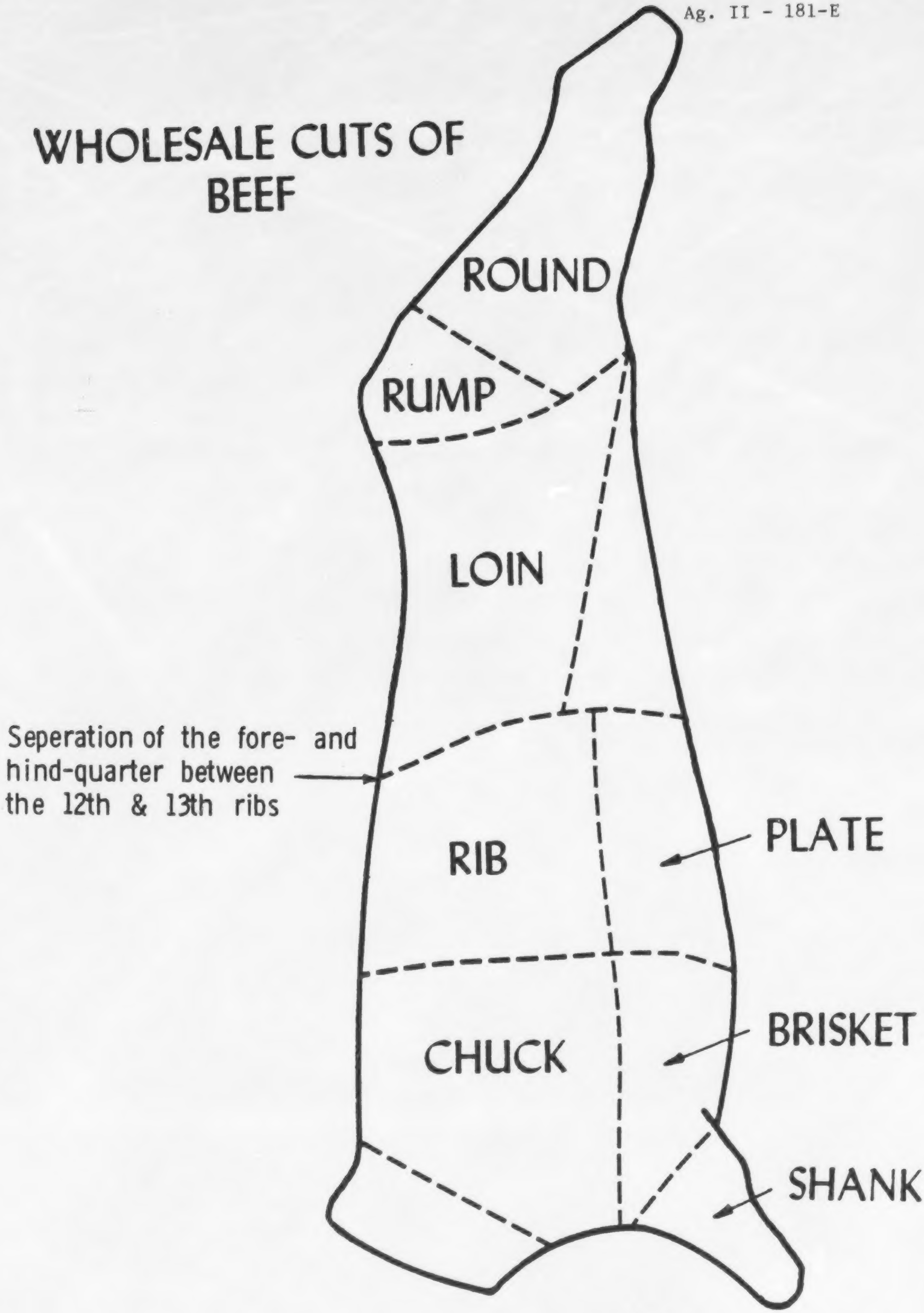
XII. Average dressing percentages

A. Beef - 55%

B. Pork - 72-75%

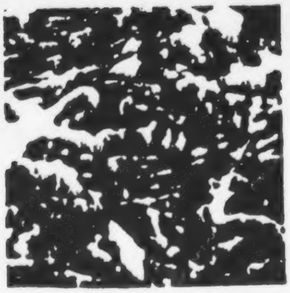
C. Lamb - 45-48%

WHOLESALE CUTS OF BEEF

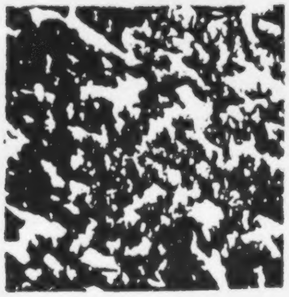

ROUND
RUMP
LOIN
Seperation of the fore- and hind-quarter between the 12th & 13th ribs
RIB
PLATE
CHUCK
BRISKET
SHANK

Ag. II - 183-E

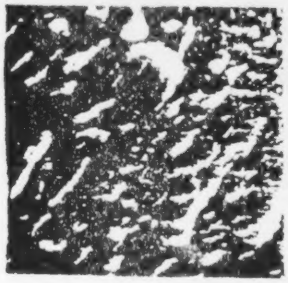
DEGREES OF MARBLING



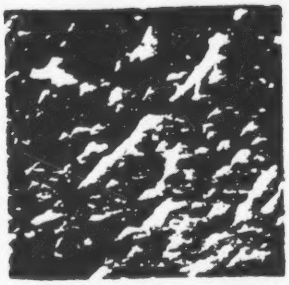
1-Abundant



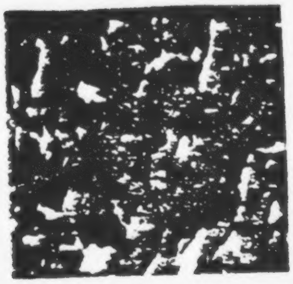
2-Moderately Abundant



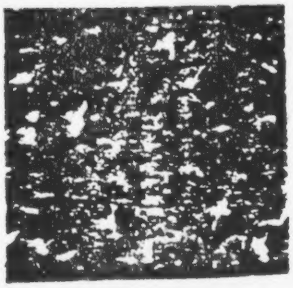
3-Slightly Abundant



4-Moderate

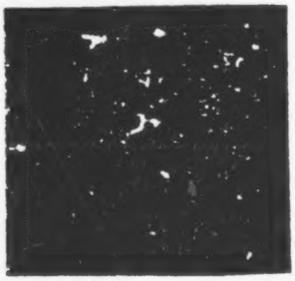


5-Modest

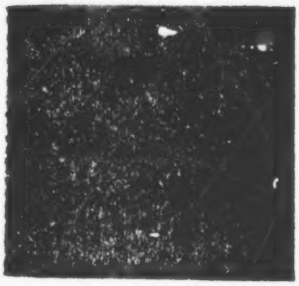


6-Small

7-Slight

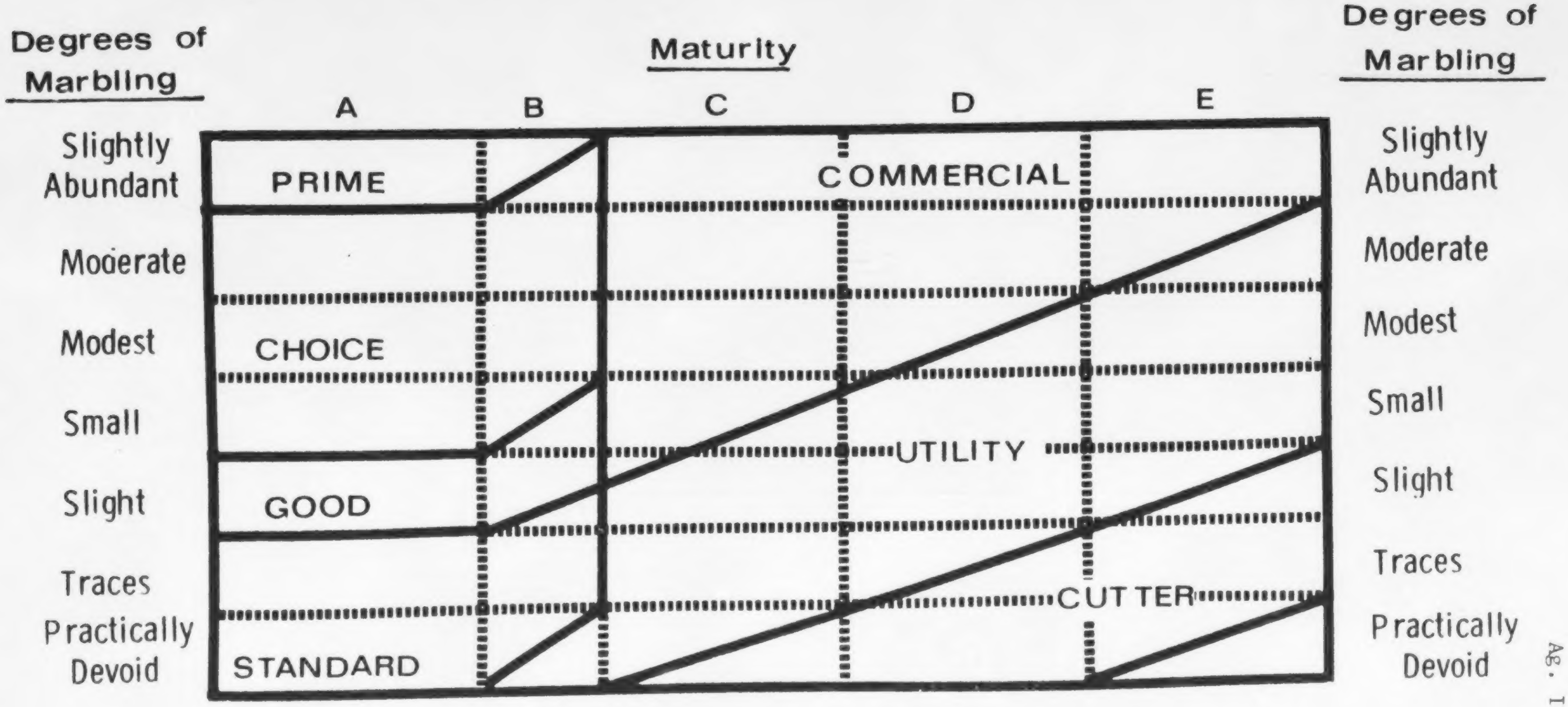


8-Traces

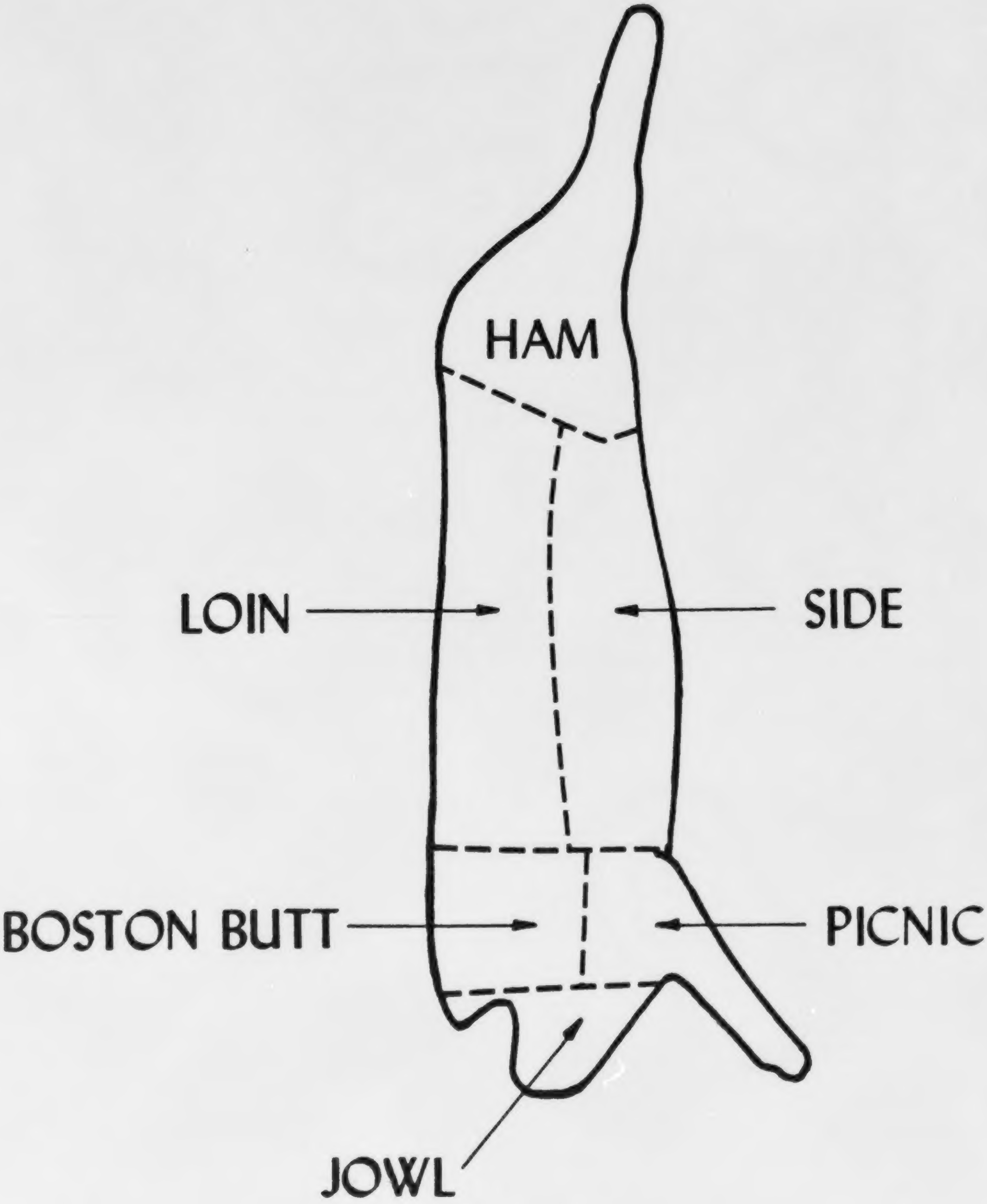


9-Practically Devoid

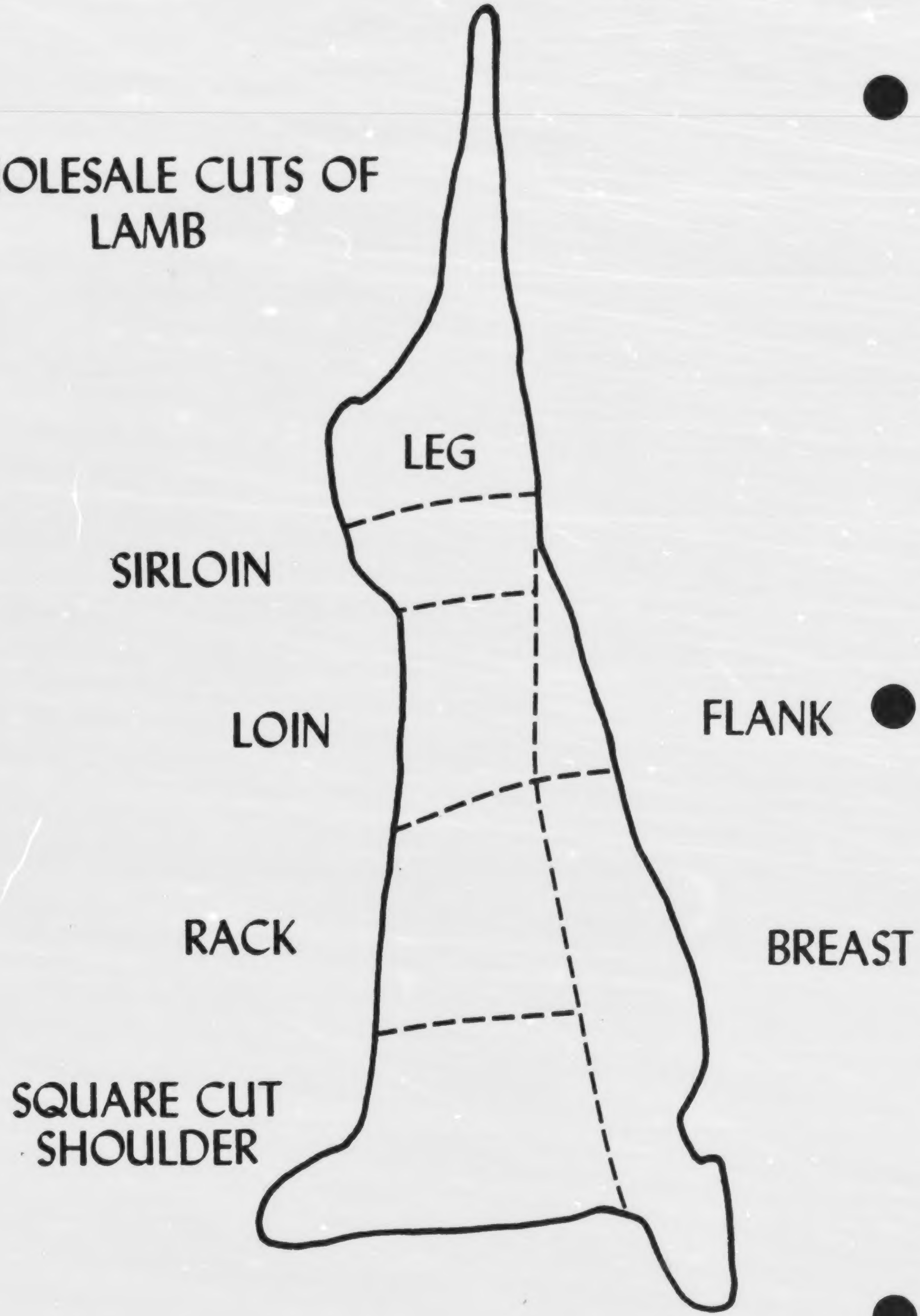
QUALITY GRADES OF BEEF



WHOLESALE CUTS OF PORK


HAM
LOIN
SIDE
BOSTON BUTT
PICNIC
JOWL

WHOLESALE CUTS OF LAMB

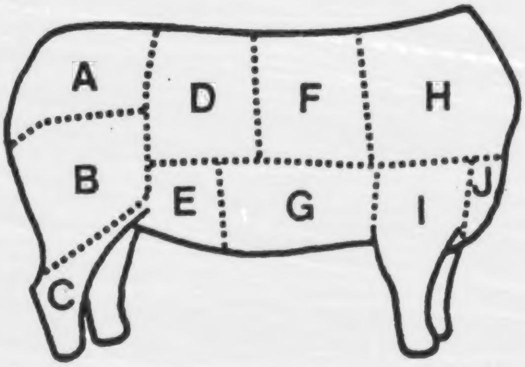

LEG
SIRLOIN
LOIN
FLANK
RACK
BREAST
SQUARE CUT SHOULDER

WHOLESALE CUTS AND QUALITY GRADES OF
BEEF, PORK, AND LAMB
UNIT VIII

TEST

1. Define the following words:
   - A. Wholesale cuts -
   - B. Marbling -
   - C. Grade -
   - D. Finish -
   - E. Quality -
   - F. Feathering -
   - G. Cutability -

2. Label the drawing below indicating the wholesale cuts of beef:



A. ______________________________

B. ______________________________

C. ______________________________

D. ______________________________

E. ______________________________

F. ______________________________

G. ______________________________

H. ______________________________

I. ______________________________

J. ______________________________

3. Match the degrees of marbling with the examples below:

_____a. Traces

_____b. Slight

_____c. Small

_____d. Modest

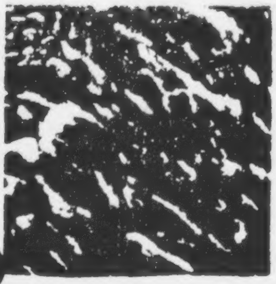
_____e. Moderate

_____f. Slightly abundant

_____g. Moderately abundant

_____h. Abundant

_____i. Practically devoid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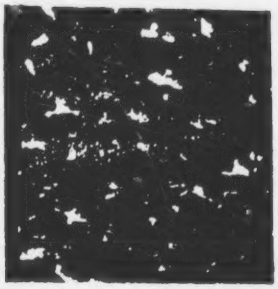
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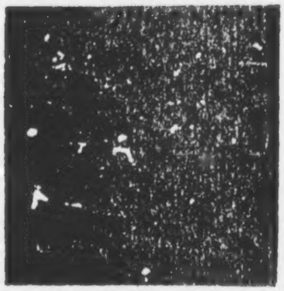
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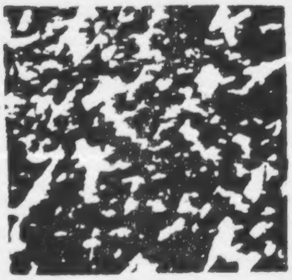
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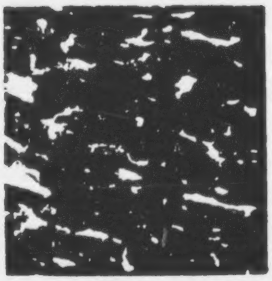
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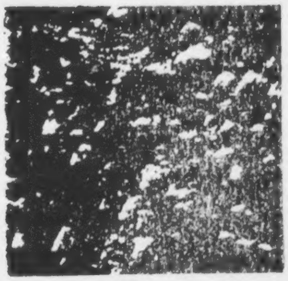
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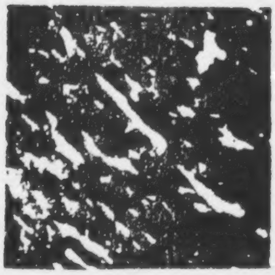
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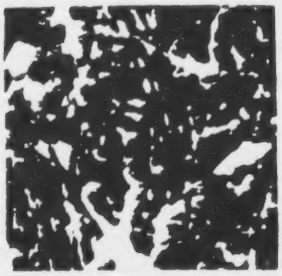
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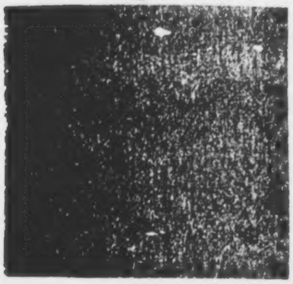
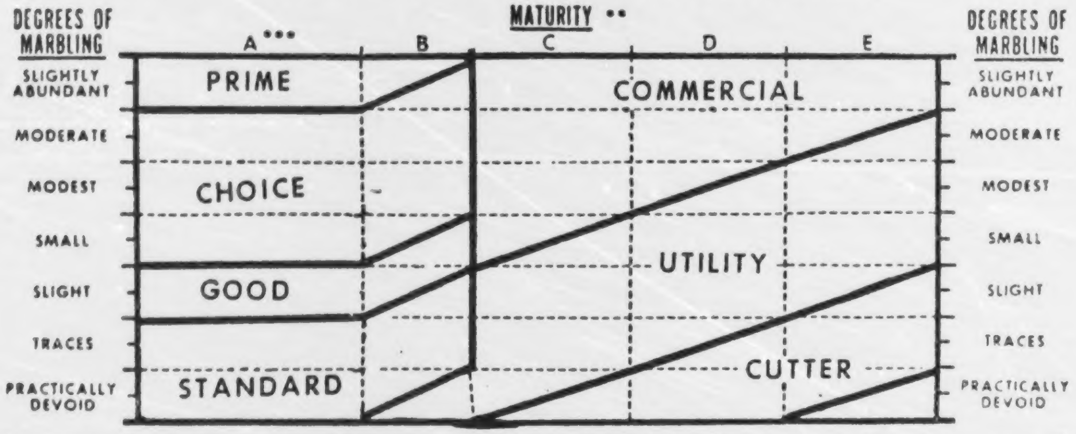

9

4. List the quality grades for beef:

a.
b.
c.
d.
e.
f.
g.
h.

5. Determine the quality grades of beef from the grading chart below:

RELATIONSHIP BETWEEN MARBLING, MATURITY, AND CARCASS QUALITY GRADE *



*Assumes that firmness of lean is comparably developed with the degree of marbling and that the carcass is not a "dark cutter."

**Maturity increases from left to right (A through E).

***The A maturity portion of the Figure is the only portion applicable to bullock carcasses.

Degree of Marbling	Maturity	Carcass Quality Grade
A. Slight	A	______
B. Moderate	C	______
C. Practically Devoid	D	______

6. List four factors that affect yield grades.

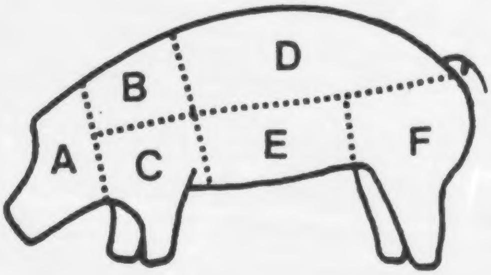
a.
b.
c.
d.

7. Match the yield grades with the characteristics of the carcasses.

_____a. 1
_____b. 2
_____c. 3
_____d. 4
_____e. 5

1. Average trimness, average weight, average muscling
2. Very wasty, heavy, poor to average muscling
3. Very trim, light weight, heavy muscled
4. Wasty, heavy, average muscling
5. Trim, average weight, above average muscling

8. Identify the wholesale cuts of pork from the drawing below:

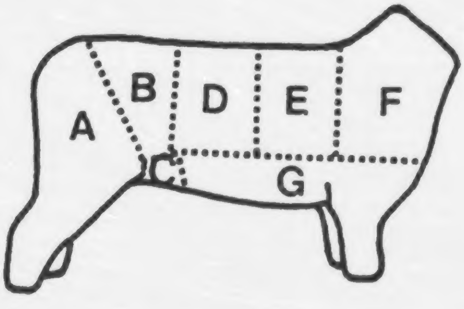


a. ____________________
b. ____________________
c. ____________________
d. ____________________
e. ____________________
f. ____________________

9. List the quality grades of pork.

a.
b.
c.
d.
e.

10. Identify the wholesale cuts of lamb from the drawing below:



a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

f. ______________________________

g. ______________________________

11. Place the lamb market grades below in order from best to least best.

a. Choice	a.
b. Utility	b.
c. Prime	c.
d. Good	d.

12. Give the average dressing percentages for the animals listed below:

a. Beef _____%

b. Pork _____%

c. Lamb _____%

BLUEPRINT READING
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to identify a pictorial view as used on a blueprint. The student should be able to demonstrate the fundamentals of blueprint reading by drawing a pictorial view and a three-view sketch of a specified rectangular block. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Indicate in writing the purpose of a blueprint.
2. List the three major views of a pictorial drawing.
3. Name the three basic elements of a blueprint.
4. Match the basic types of dimensions with their uses.
5. Identify six common types of lines used in a blueprint.
6. Match fifteen blueprint abbreviations with their corresponding identifications.
7. Draw a simple three-view sketch of a rectangular block 8" long by 1" wide by 1/2" thick with correct dimensions.

BLUEPRINT READING
UNIT I

INFORMATION SHEET

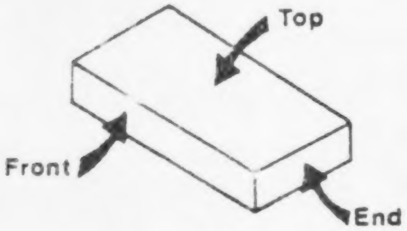
I. Purpose of blueprint - To convey a message from the draftsman to the workman indicating shapes and dimensions of objects to be built

II. Major view of a pictorial drawing (Transparency 1)

   A. Top

   B. Front

   C. End



III. Basic elements of blueprint

   A. Lines - Give shape and dimensioning of the object

   B. Dimensions - Give size and location of various segments of items being constructed

   C. Notes - Give details of construction not shown by lines

IV. Types of dimensions (Transparecy 2)

   A. Overall - Describes a total distance such as the complete length, width, or thickness of a part

   B. Size - Give information concerning the size of a part

   C. Location - Gives information concerning the location of some detail of construction, such as a hole

V. Basic lines used in blueprint reading (Transparencies 3 and 4)

A. Border line - Serves as a frame for the blueprint

B. Object line - Indicates the outline of an object

C. Hidden line - Represents an edge that cannot be seen from the outside of the object

D. Extension line - Indicates the exact distance the dimension describes

E. Dimension line - Extends between the extension lines to clarify dimensions

F. Center line - Used to locate the center of a circle or a curved surface

G. Pointer line - Shows the detail described by a dimension of note

H. Cutting plane line - Used to show the shape of complicated parts

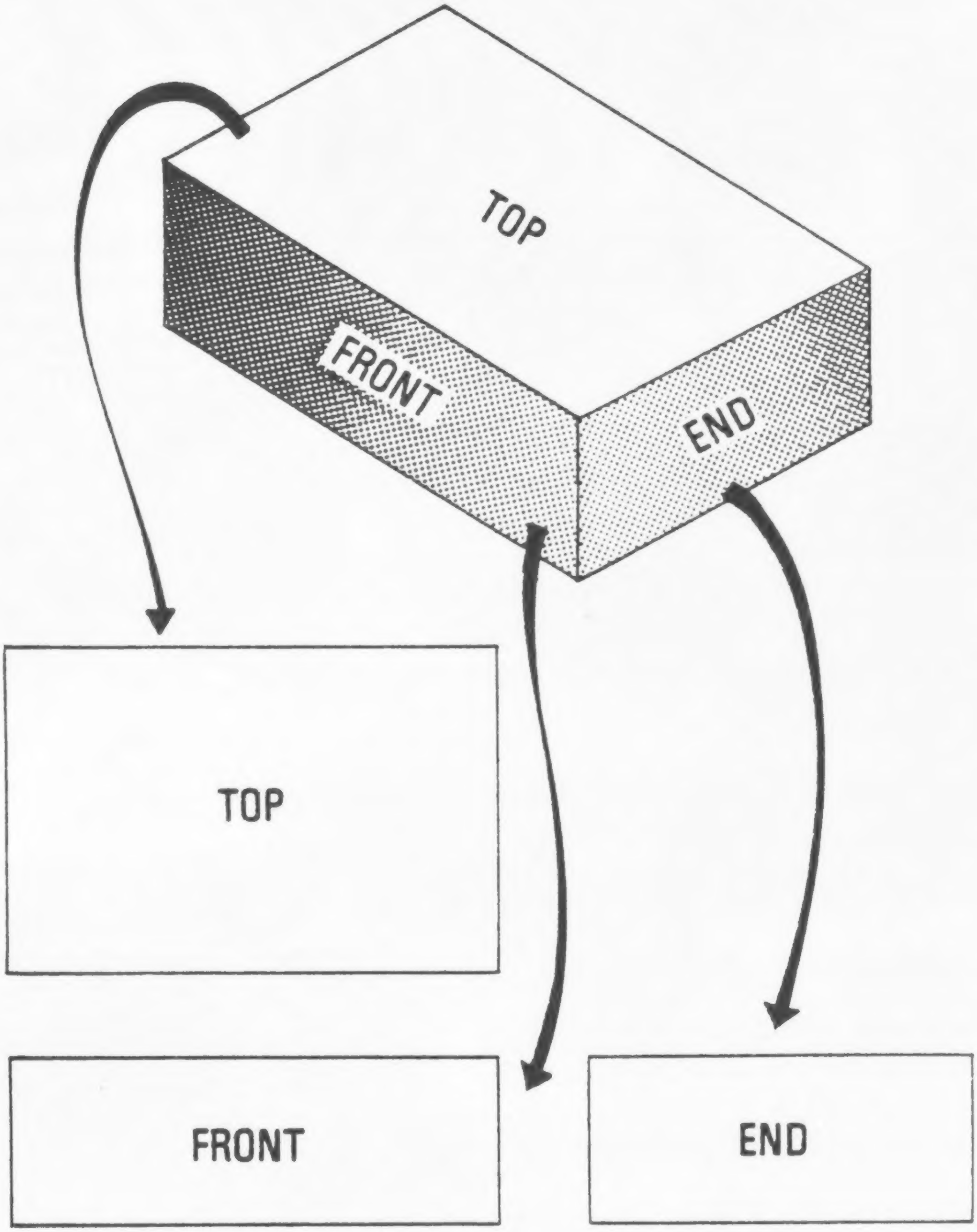
I. Break line - Used to show interior detail

VI. Common abbreviations used on blueprints

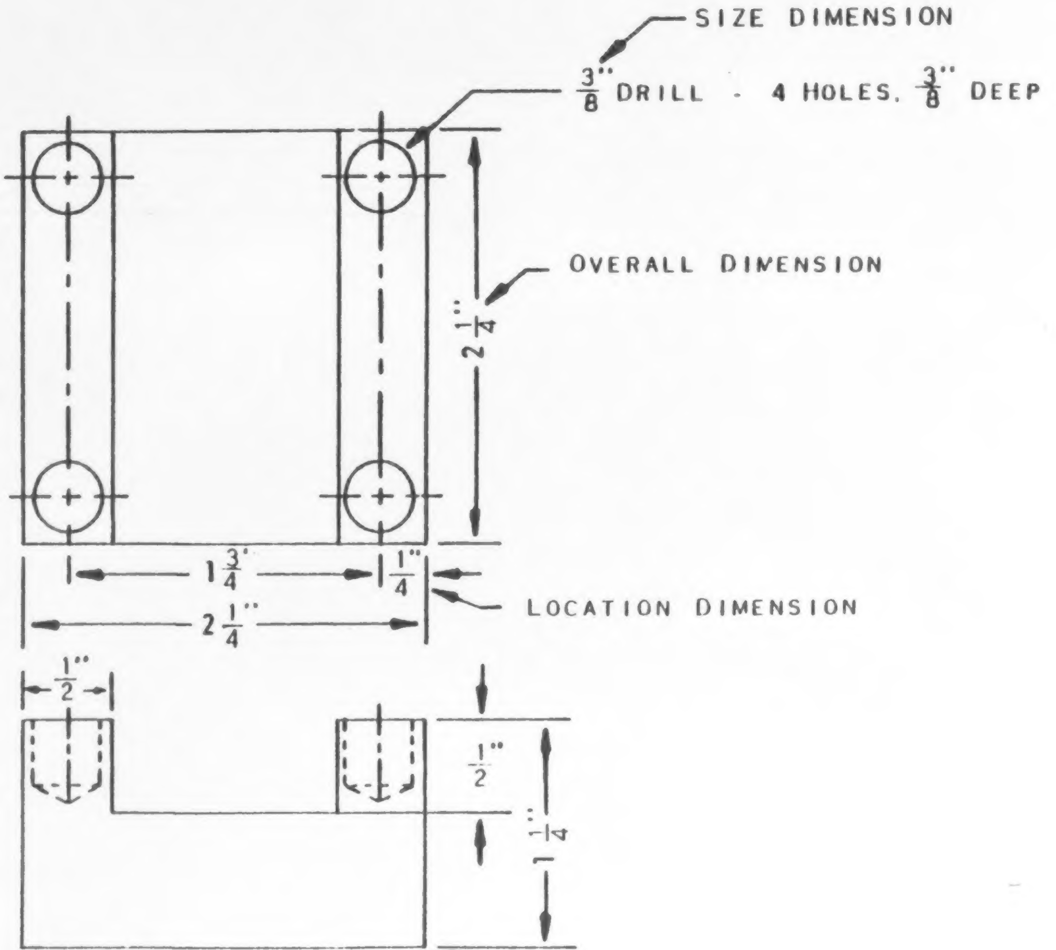
C. I. = Cast Iron
C. C. = Center to Center
C. Bore = Counterbore
C. R. S. = Cold Rolled Steel
C.S. = Cast Steel
Csk. = Countersink
Dia. = Diameter
F = Finish
F. A. O. = Finish All Over
Fin. = Finish
F. S. = Full Size
F. S. D. = Full Size Detail
Hex = Hexagon
I. D. = Inside Diameter
N. C. = National Coarse
N. F. = National Fine
No. or # = Number
O. C. = On Center
O. D = Outside Diameter
R. or Rad = Radius
Req'd = Required

S. A. E. = Society of Automotive Engineers
Sq. = Square
U. S. S. = United States Standard
N. T. S. = Not to Scale
Cir = Circular
Cyl = Cylinder
Deg or ° = Degree(s)
Ga = Gauge
GI = Galvanized Iron
I = I Beam
In. of " = Inch(es)
Mal I = Malleable Iron
Std = Standard
Stl = Steel
Stl C = Steel Casting
Thd or Thds = Thread(s)
WI = Wrought Iron
Br# = Brass, SAE#
Bro# = Bronze, SAE#
Chfr = Chamfer

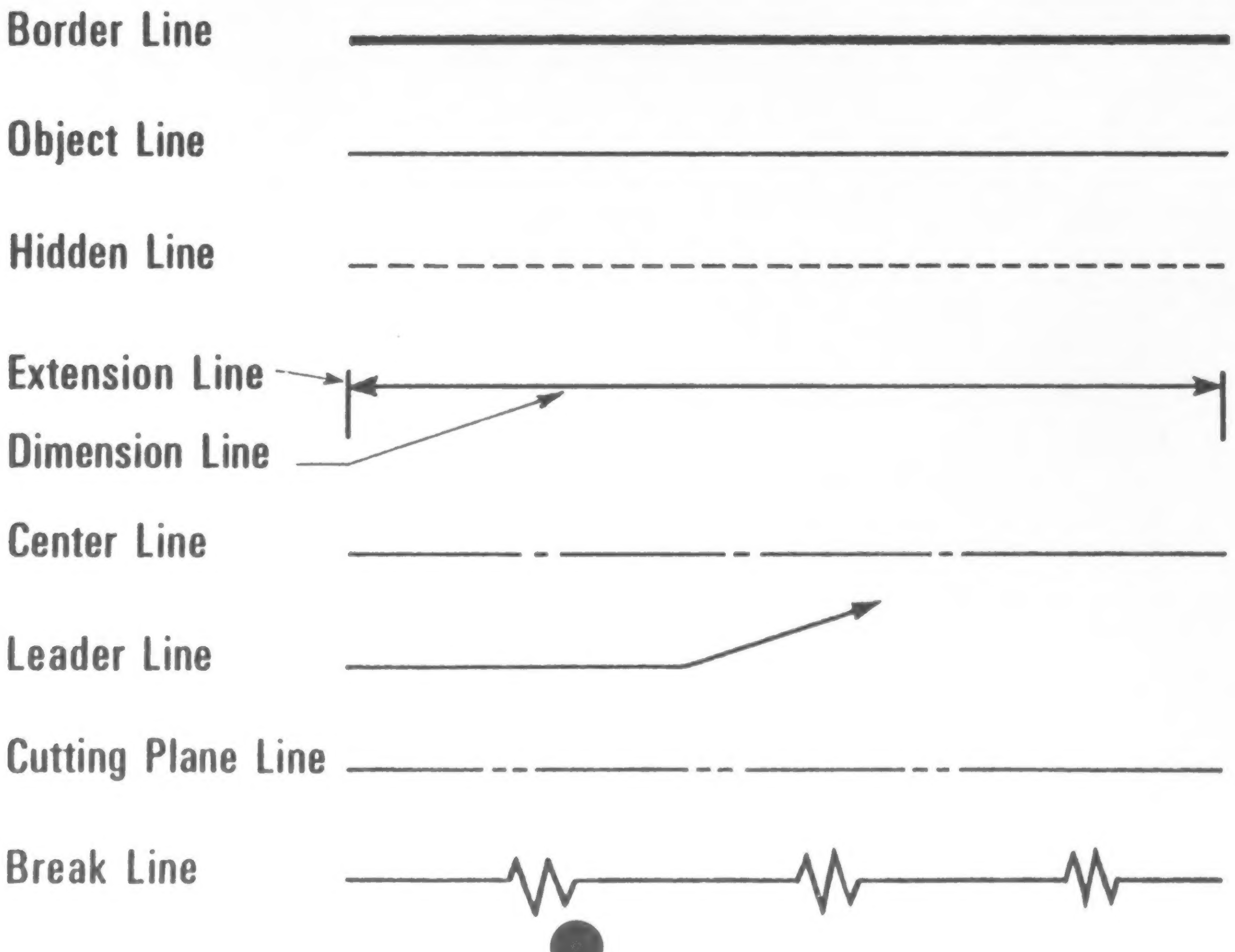
CONVERTING A PICTORIAL VIEW INTO A 3-SIDED VIEW


TOP
FRONT
END
TOP
FRONT
END

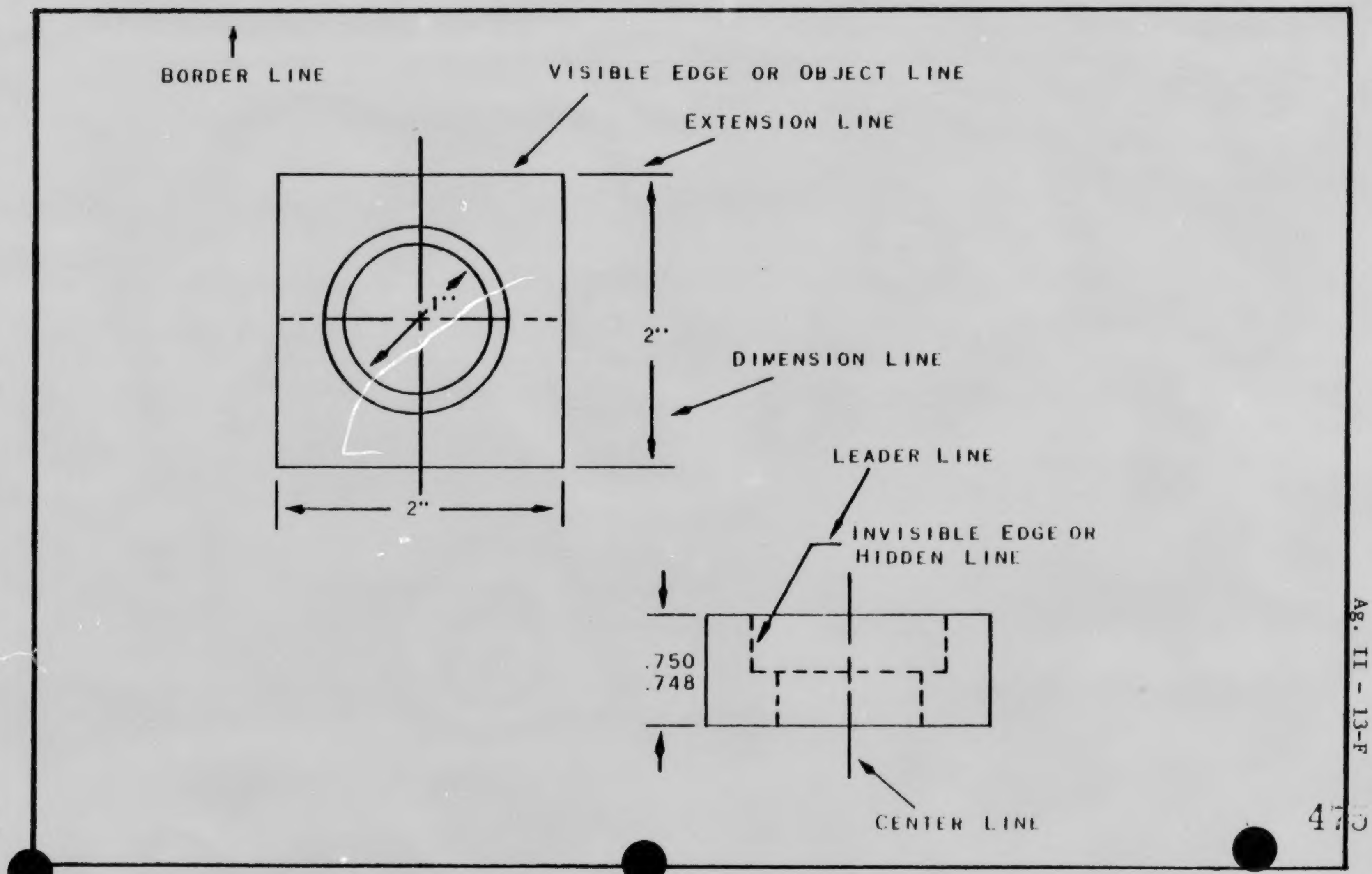
TYPES OF DIMENSIONS ON A BLUEPRINT


SIZE DIMENSION
3/8" DRILL - 4 HOLES, 3/8" DEEP
OVERALL DIMENSION
2 1/4"
1 3/4'
1/4"
LOCATION DIMENSION
2 1/4"
1/2"
1/2"
1 1/4"

BASIC LINES USED IN BLUEPRINT READING


Border Line
Object Line
Hidden Line
Extension Line
Dimension Line
Center Line
Leader Line
Cutting Plane Line
Break Line

USE OF LINES ON A BLUEPRINT


BORDER LINE
VISIBLE EDGE OR OBJECT LINE
EXTENSION LINE
1"
2"
DIMENSION LINE
2"
LEADER LINE
INVISIBLE EDGE OR HIDDEN LINE
.750
.748
CENTER LINE

BLUEPRINT READING
UNIT I

ASSIGNMENT SHEET #1--DRAWING A THREE-VIEW SKETCH

Draw a three-view sketch of a rectangular block using the following dimensions. Be sure to show your dimensions.

A. 10" long by 2" wide by 1" thick

B. 12" long by 1" wide by 1/4" thick

BLUEPRINT READING
UNIT I

TEST

1. Write the purpose of a blueprint for a workman.

2. List the three major views of a blueprint.

   a.

   b.

   c.

3. Draw the three major views of a sketch of a rectangular block 8" long by 1" wide by 1/2" thich, using correct dimensions.

4. Name the three basic elements of a blueprint.

   a.

   b.

   c.

5. Match the basic type of dimension with it's proper function.

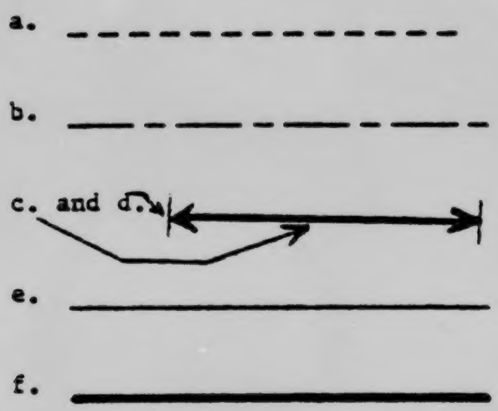
_____a. Location dimension

_____b. Overall dimension

_____c. Size

1. Gives information concerning the size of a part
2. Gives information concerning the location of some detail of construction, such as a hole
3. Gives the total distance, such as the complete length, width, or thickness of a part

6. Corectly identify the following lines.



a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

f. ____________________

7. Correctly identify the common lines on the following blueprint drawing.

a. ____________________

b. ____________________

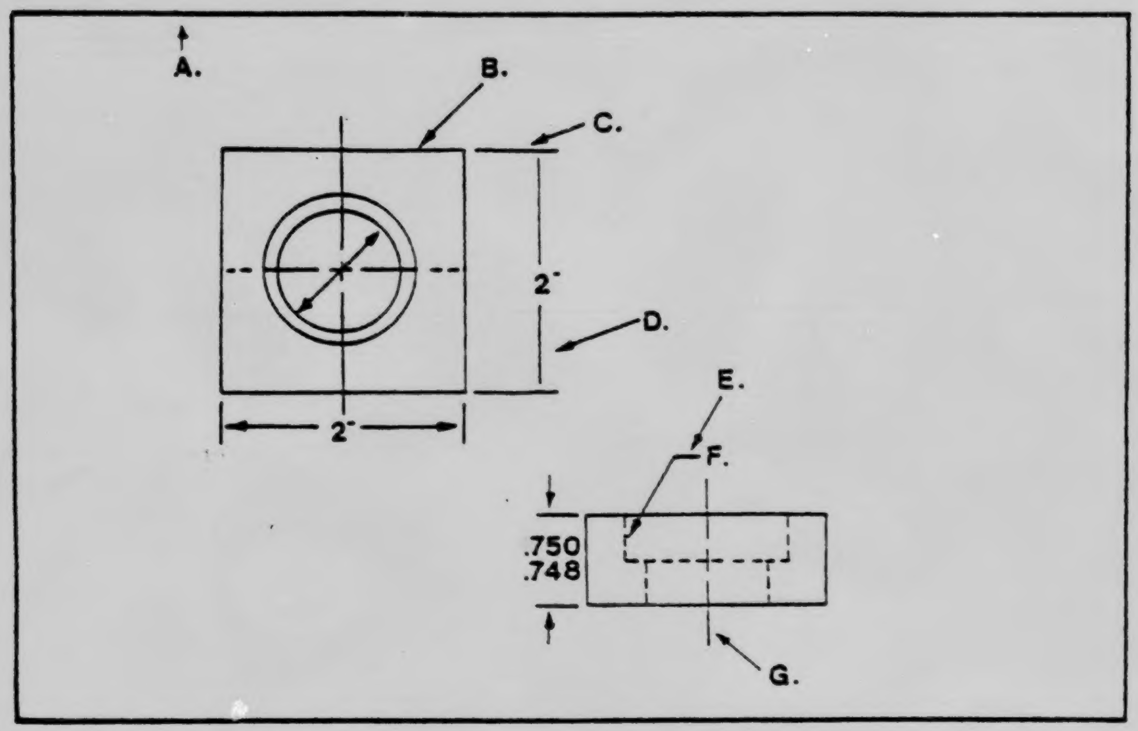
c. ____________________

d. ____________________

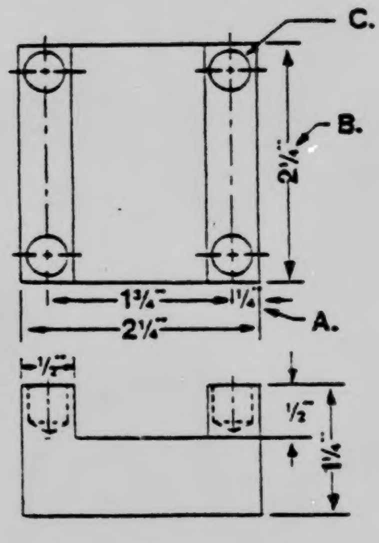
e. ____________________

f. ____________________

g. ____________________


A.
B.
C.
2"
D.
2"
E.
F.
.750
.748
G.

8. Correctly identify the basic types of dimensions on the following blueprint drawing.


C.
B.
2¼"
1¾"
¼"
A.
2¼"
½"
½"
1¼"

a. ____________________

b. ____________________

c. ____________________

9. Match the following abbreviations with the correct identification.

_____a. Std
_____b. Csk.
_____c. O. D.
_____d. Mal I
_____e. Hex
_____f. Cyl
_____g. Br#
_____h. Stl
_____i. Sq.
_____j. Chfr
_____k. Deg
_____l. Cir
_____m. Fin
_____n. R.
_____o. N.C.

1. Finish
2. Thread
3. Chamfer
4. Bronze, SAE#
5. Steel
6. Brass, SAE#
7. Wrought Iron
8. Galvanized Iron
9. Circular
10. Radius
11. Standard
12. National Coarse
13. Hexagon
14. Degree
15. Square
16. Countersink
17. Outside Diameter
18. Cylinder
19. Malleable Iron
20. Cast Steel

POSITION WELDING
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to deposit beads in the flat, vertical, and horizontal positions using an E-6011 and/or E-6010 electrode. The student should be able to construct a V-butt weld in flat position and run a continuous bead without breaking the arc. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match nine terms used in position welding with their definitions.
2. List four factors that determine proper current adjustment.
3. List three reasons for removing slag from a bead.
4. Name three reasons for fusing one bead in with another.
5. List the four variables that determine weld quality.
6. Identify beads made with:
    a. Short arc
    b. Long arc
    c. Low amperage
    d. High amperage
7. Demonstrate the method of starting, stopping, and restarting a bead.
8. Demonstrate the ability to construct a complete pad on 3/8" plate, 6" by 6", using E-6011 and/or E-6010 electrode paying special attention to proper fusion of lapping beads in the following positions:
    a. Flat
    b. Horizontal
    c. Vertical (up)
9. Demonstrate the ability to make a V-butt weld in flat position and run a continuous bead.
10. Demonstrate the ability to make vertical up Butt and Fillet welds on plate exceeding 1/8 inch thickness using E-6011 electrodes.

11. Demonstrate the ability to make vertical down Butt and Fillet welds on plate 1/8 inch or less thickness using E-6013 electrodes.
12. Demonstrate the ability to make overhead Butt and Fillet welds on 1/8 inch or thicker plate using E-6011 electrodes.
13. Pass Arc Welding safety questions included in unit test with 100% accuracy.

POSITION WELDING
UNIT II

INFORMATION SHEET

I. Terms and definitions

A. Pads - The metal plates which have beads running parallel to each other in such a way that the beads are united with one another to form a solid mass.

B. Horizontal position - The running of a horizontal bead on a vertical surface.

C. Vertical position- The beads deposited in a vertical position on a horizontal surface.

D. Face - The exposed surface of a fusion weld.

E. Root - The bottom surface of a fusion weld.

F. Penetration - The distance from the original surface of the base metal to that point at which fusion ceases.

G. Undercutting - The portion of the crater left unfilled due to excessive current and the improper movement of the electrode occurring at the edge of the bead.

H. Porosity - A condition which is caused by a gas pocket being trapped in a weld as it solidifies.

I. Crater - A depression in the face of a weld caused by arc force.

J. Fusion - The melting of metals until the molten portions unite with each other.

II. Factors determining proper current adjustment

A. Length of welding cables

B. Kind and thickness of base metal

C. Diameter and type of electrode

D. Welding technique used by operator

E. Efficiency of welding machine and polarity

F. Size of fillet weld

G. Welding positions

III. Reasons for removing slag

(NOTE: Slag should be removed after metal is partially cooled.)

- A. Permits better fusion of beads
- B. Prevents gas pockets from forming in bead
- C. Improves appearance of bead

IV. Reasons for fusing one bead in with another

- A. Increases strength of weld
- B. Improves appearance of bead
- C. Improves penetration

V. Variables that determine weld quality

- A. Amperage
- B. Length of arc
- C. Speed of travel
- D. Position of electrode

VI. Causes of properly and improperly formed beads (Transparency 1)

- A. Current, voltage, and speed normal
- B. Current too low
- C. Current too high
- D. Voltage to low
- E. Voltage too high
- F. Speed too slow
- G. Speed too fast

VII. Methods of starting, stopping, and restarting a bead

- A. Starting
    1. Hold electrode perpendicular to work
    2. Slant electrode 10° - 15° in direction of travel
    3. Lower electrode and tap lightly on edge of plate
    4. Raise electrode as arc strikes
    5. Lower electrode to shorten arc

    6. As desired crater develops, move electrode out slowly with normal movement
    7. Move electrode to build up desired height and width of bead

B. Stopping

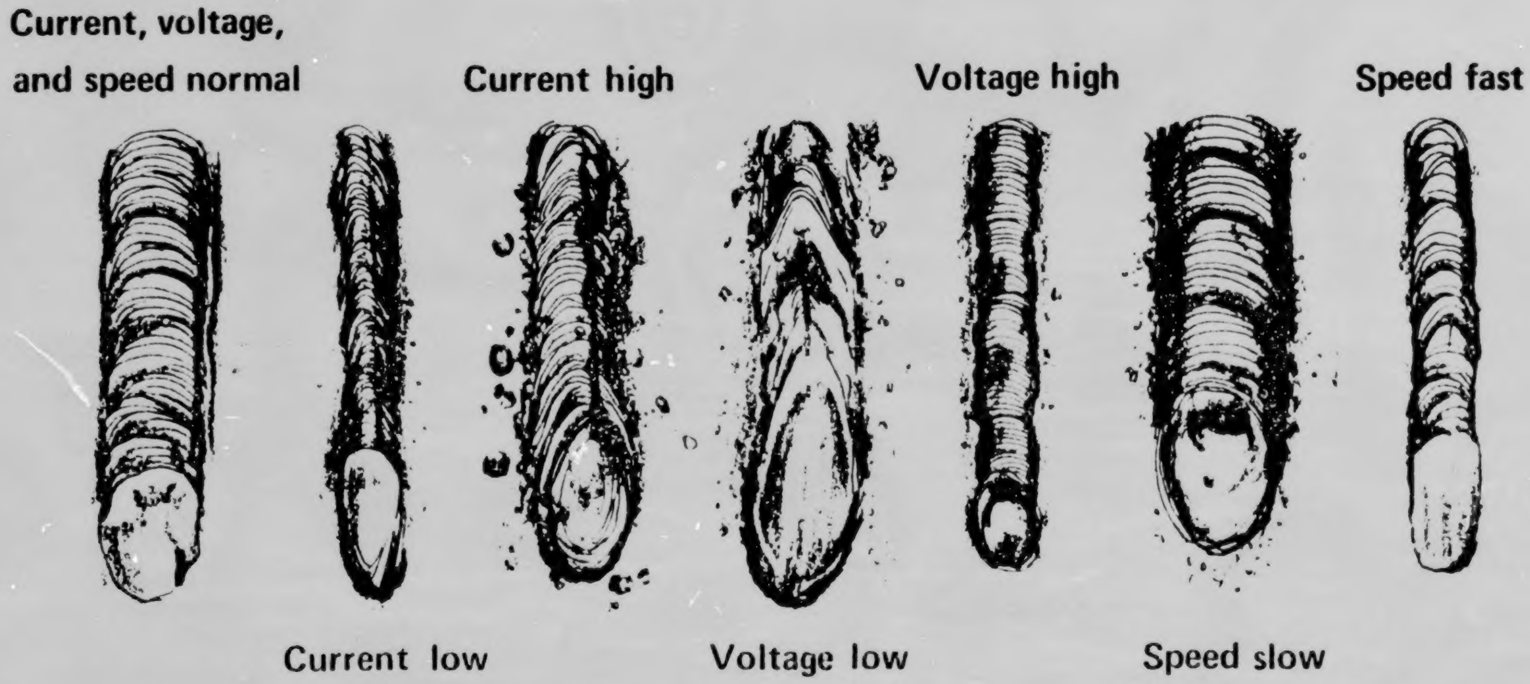
    1. As weld length is reduced, return electrode perpendicular to work
    2. Lower electrode to shorten arc
    3. Move electrode to build up crater and remove impurities
    4. Raise electrode quickly to break arc
    5. Development of desired bead

C. Restarting

    1. Start arc about 1/2" to 1" in front of crater
    2. Use long arc movement back to within 1/16" of the crater crown
    3. Bring electrode down rapidly
    4. Continue welding maintaining correct width of bead

VIII. Review arc welding safety

Properly and Improperly Formed Beads


Current, voltage, and speed normal
Current low
Current high
Voltage low
Voltage high
Speed slow
Speed fast

POSITION WELDING
UNIT II

JOB SHEET #1 - MAKING A PAD IN THE FLAT POSITION

I. Tools and equipment

   A. Welder, electrode holder, and ground clamp

   B. Gloves, helmet, and safety glasses

   C. Chipping hammer

   D. Wire brush

   E. Pliers or vise grips

II. Materials

   A. Mild steel metal 3/8" thick, 4" x 4"

   B. E-6011 or E-6010 electrode

III. Procedures

   A. Prepare metal for welding

   B. Place metal in proper welding position

   C. Strike arc and begin welding

   D. Hold electrode at a 15° to 30° angle in direction of travel

   E. After completion of one bead, chip and brush clean

   F. Check bead and surface for

      1. Surface appearance

      2. Pinholes, crater holes, slag holes, or improper starts and stops

      3. Determine if current or amps need to be changed

   G. Continue running beads overlapping at least the first one-third of the previous bead

   H. Clean each pass before running next bead

   I. Fuse each pass with base metal and prior bead

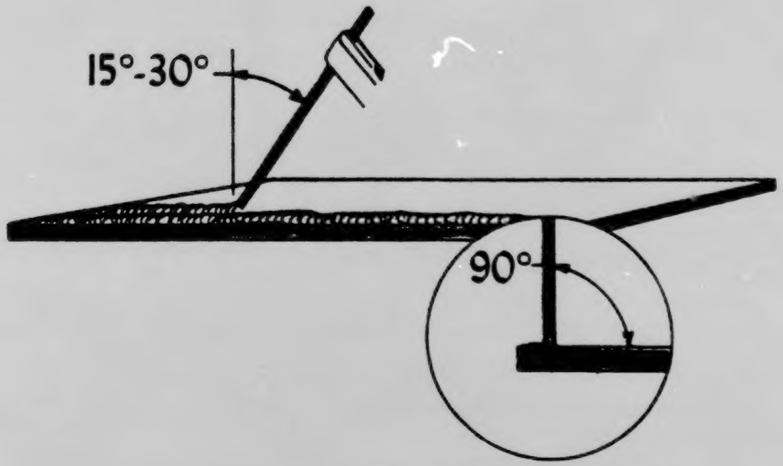
   J. Overlapping beads should produce a smooth surface without "valleys" between passes

   K. Continue welding until pad is filled with beads

   L. Clean metal and turn in to the instructor for grading

Job Sheet #1

IV. Diagram of the procedure



Front or Back View

POSITION WELDING
UNIT II

JOB SHEET #2 - MAKING A PAD IN THE HORIZONTAL POSITION

I. Tools and equipment

  A. Welder, electrode holder, and ground clamp

  B. Gloves, helmet, and safety glasses

  C. Chipping hammer

  D. Wire brush

  E. Pliers or vise grips

II. Materials

  A. Mild steel metal 3/8" thick, 4" x 4"

  B. E-6011 or E-6010 electrode

III. Procedure

  A. Prepare metal for welding

  B. Place metal in proper welding position

  C. Hold electrode 20° away from deposited bead in direction of travel

  D. Point electrode upward 5° to 10° to offset gravity

  E. Strike arc and begin welding

  F. Move electrode to prevent sagging and causing an overlap and undercutting

  G. Run a straight bead along the bottom side

  H. After laying one bead, chip and brush clean

  I. Check bead and surface

    1. Surface appearance

    2. Pinholes, crater holes, slag holes, or improper starts and stops

    3. Determine by appearance if current and amps need to be changed

  J. Continue running beads overlapping less than one-third of the previous bead as for flat welding

  K. Clean each pass before overlapping

Job Sheet #2

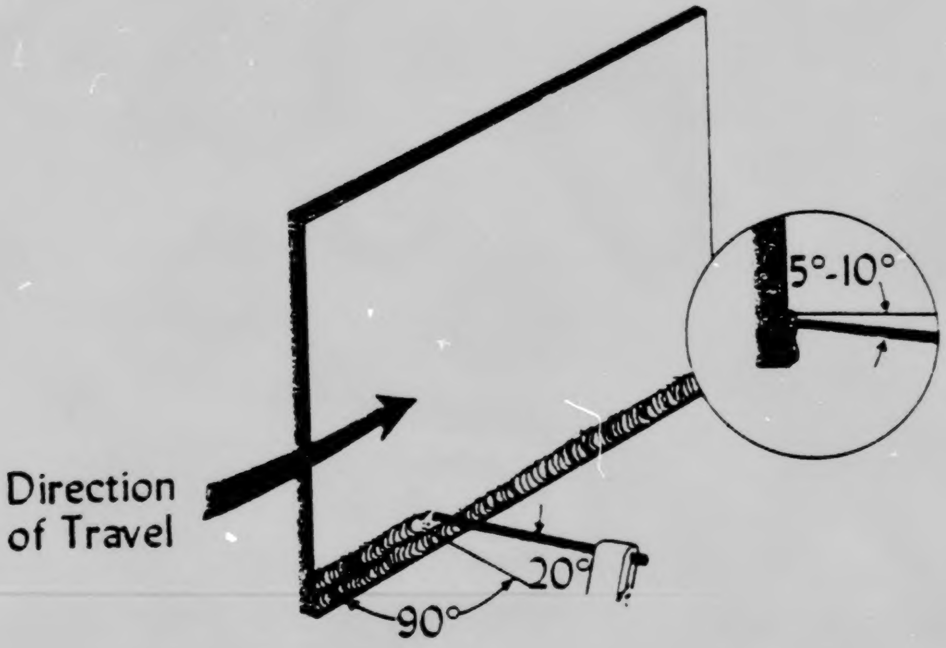
L. Fuse each pass with base metal and other bead

M. Overlapping beads should produce a smooth surface without "valleys" between passes

N. Continue welding until pad is filled with beads

O. Clean metal and turn in to the instructor for grading

III. Diagram of the procedure



POSITION WELDING
UNIT II

JOB SHEET #3 - MAKING A V-BUTT WELD

I. Tools and equipment

- A. Welder, electrode holder, and ground clamp
- B. Gloves, helmet, and safety glasses
- C. Chipping hammer
- D. Grinder
- E. Wire brush
- F. Pliers
- G. Steel tape

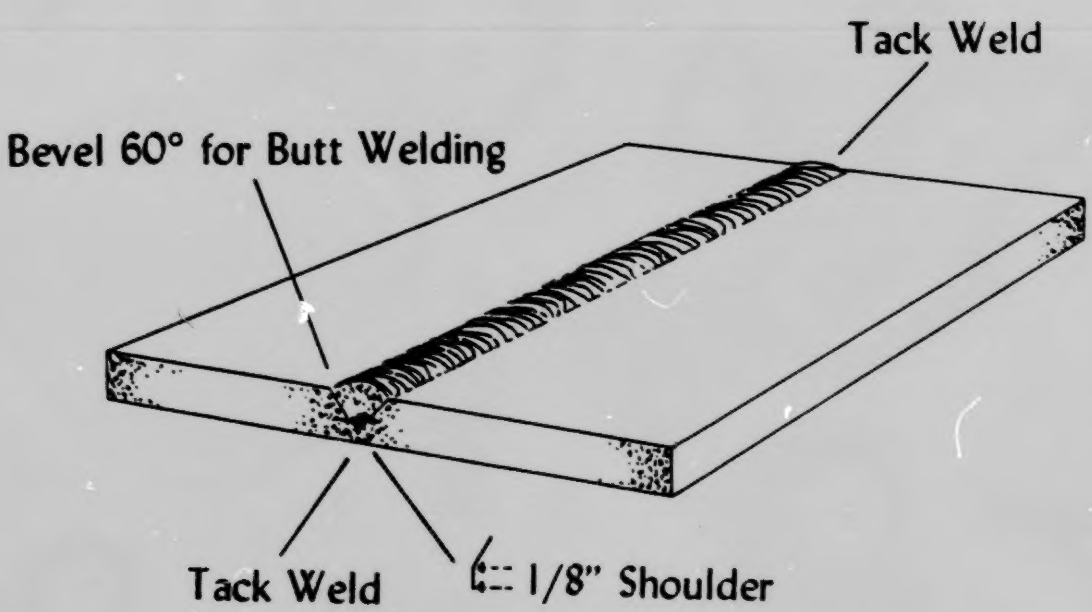
II. Materials

- A. Two pieces of steel plate 5" long by 3" wide by 3/8" thick
- B. E-6011 or E-6010 electrode

III. Procedures

- A. Prepare metal for welding
  1. Bevel edges to form a 60° included angle for the V-butt
  2. Place two pieces together parallel to each other
  3. Metal should be spaced 3/32" to 1/8"
  4. Tack weld pieces together at both ends
  5. Place metal in proper position
- B. Weld pieces together using a single pass
- C. Chip slag and brush clean
- D. Turn in to instructor for grading

IV. Diagram of the procedure


Tack Weld
Bevel 60° for Butt Welding
Tack Weld
1/8" Shoulder

POSITION WELDING
UNIT II

JOB SHEET #4 - RUNNING A CONTINUOUS BEAD

I. Tools and equipment

   A. Welder, electrode holder, and ground clamp
   B. Gloves, helment, and safety glasses
   C. Chipping hammer
   D. Wire brush
   E. Pliers

II. Materials

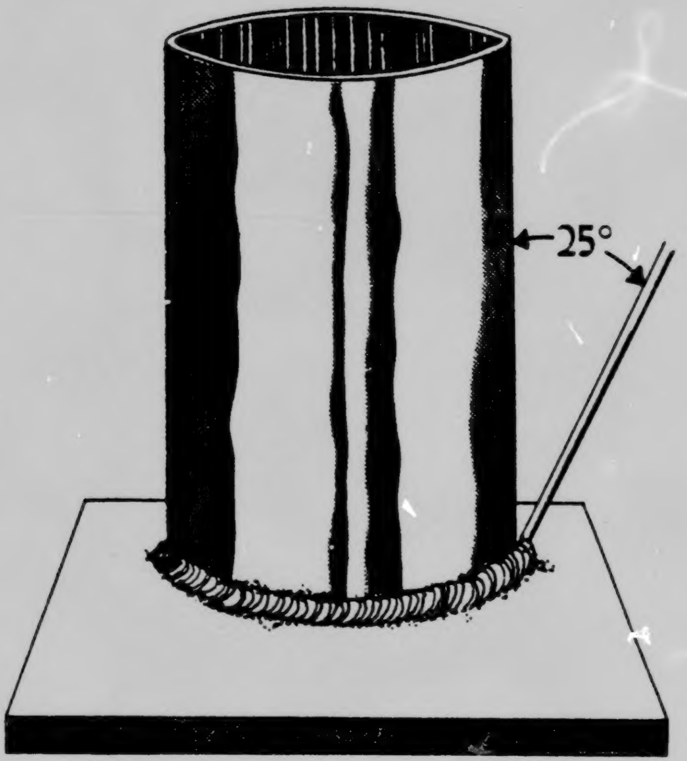
   A. Mild steel plate 4" long by 4" wide by 1/8" to 3/8" thick
   B. Black pipe nipple 4" long by 3/4" to 2" in diameter

III. Procedures

   A. Place nipple near center of plate
   B. Place metal in proper welding position
   C. Start weld at position shown in diagram
   D. Hold electrode 25° from nipple
   E. Tack weld and check position
   F. Strike arc and continue welding without breaking arc
   G. Chip slag and brush clean
   H. Turn in to instructor for grading

Job Sheet #4

IV. Diagram of the procedure



POSITION WELDING
UNIT II

JOB SHEET #5 - RUNNING VERTICAL UP BUTT WELDS

I. Tools and equipment

- A. Welder, electrode holder, and ground clamp
- B. Gloves, helmet, and safety glasses
- C. Chipping Hammer
- D. Grinder
- E. Wire brush
- F. Pliers
- G. Rule

II. Materials

- A. Two pieces of steel plate, 2" x 4" by 5/32" to 3/16" thick
- B. E-6011 electrodes - 1/8" diameter

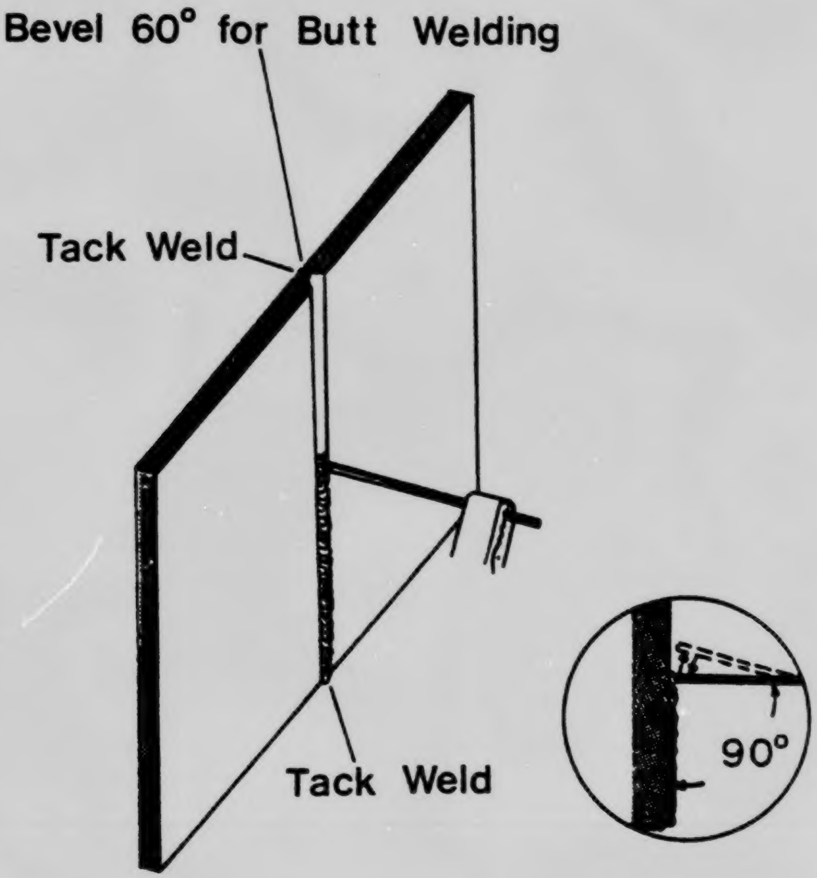
III. Procedures

- A. Prepare metal for welding
    1. Place two piece parallel with 1/16" to 3/32" spacing, and lock both ends
    2. Position plate with joint in vertical position

       (NOTE: With in 30° of perpendicular is considered vertical)
    3. Placement of plates allow for free movement and positioning of the electrode
- B. Weld pieces together using a single pass
    1. One size smaller electrode is recommended than used for flat welding
    2. Begin with electrode pointed slightly down, and build a shelf of weld metal at the start of the bead
    3. Rotate the electrode so it points slightly upward ($5-10^\circ$). Use a short arc
    4. Weld upward using an oscillating movement (up and down) of electrode tip. Oscillation of tip allows cooling time for the puddle and prevents icicling
- C. Chip slag and brush clean
- D. Turn in to the instructor for a grade

Job Sheet #5

IV. Diagram of the procedure


Bevel 60° for Butt Welding
Tack Weld
Tack Weld
90°

POSITION WELDING
UNIT II

JOB SHEET #6 - RUNNING VERTICAL UP FILLET WELDS

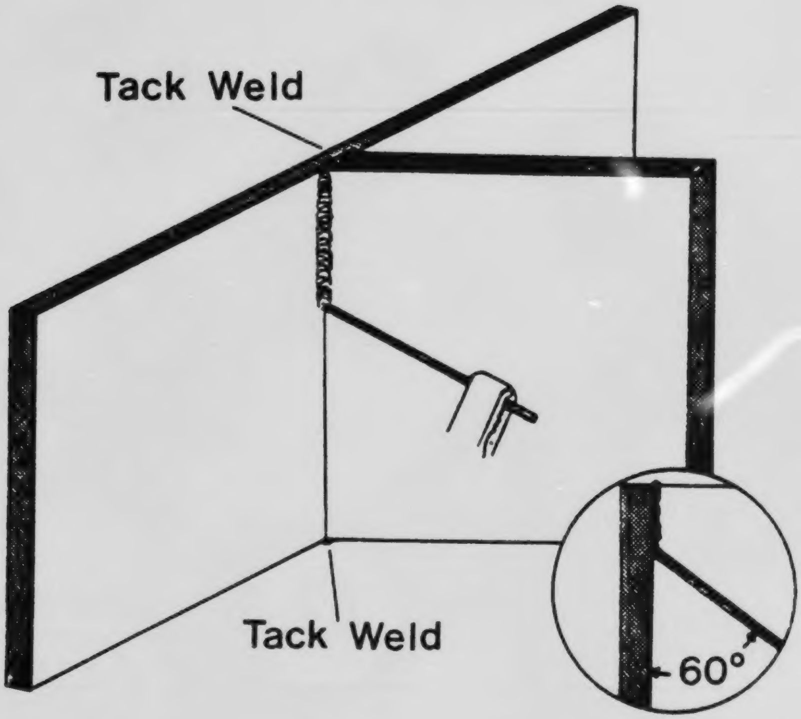
I. Tools and equipment

- A. Welder, electrode holder, and ground clamp
- B. Gloves, helmet, and safety galsses
- C. Chipping Hammer
- D. Grinder
- E. Wire brush
- F. Pliers
- G. Rule

II. Materials

- A. Two pieces of steel plate, 2" x 4" by 5/32" to 3/10" thick
    - 1. Place two pieces of metal to form 90 Fillet and tack at both ends
    - 2. Position plates with joint in vertical position
      (Note: within 30° of perpendicular is considered vertical)
    - 3. Placement of plates should allow for free movement of electrode
- B. Weld pieces together using a single pass
    - 1. One size smaller electrode is recommended than used for flat welding
    - 2. Electrode should be positioned to bisect the fillet angle. When pieces are of unequal thickness, point the electrode more towards the thicker piece
    - 3. Begin with electrode pointing slightly downward and build a shelf of weld metal at the start of the bead
    - 4. Rotate the electrode so it points slightly upward (5-10°). Use a short arc
    - 5. Weld upward using an oscillating movement (up and down) of the electrode tip
- C. Chip slag and brush clean
- D. Turn in to instructor for grading

IV. Diagram of the procedure


Tack Weld
Tack Weld
60°

POSITION WELDING
UNIT II

JOB SHEET # 7 - RUNNING VERTICAL DOWN BUTT WELDS

I. Tools and equipment

- A. Welder, electrode holder, and ground clamp
- B. Gloves, helmet, and safety glasses
- C. Chipping hammer
- D. Wire brush
- E. Grinder
- F. Pliers
- G. Rule

II. Materials

- A. Two pieces of steel plate, 2" x 4" by 3/32" to 1/8" thick
- B. E-6013 electrodes - 3/32" diameter

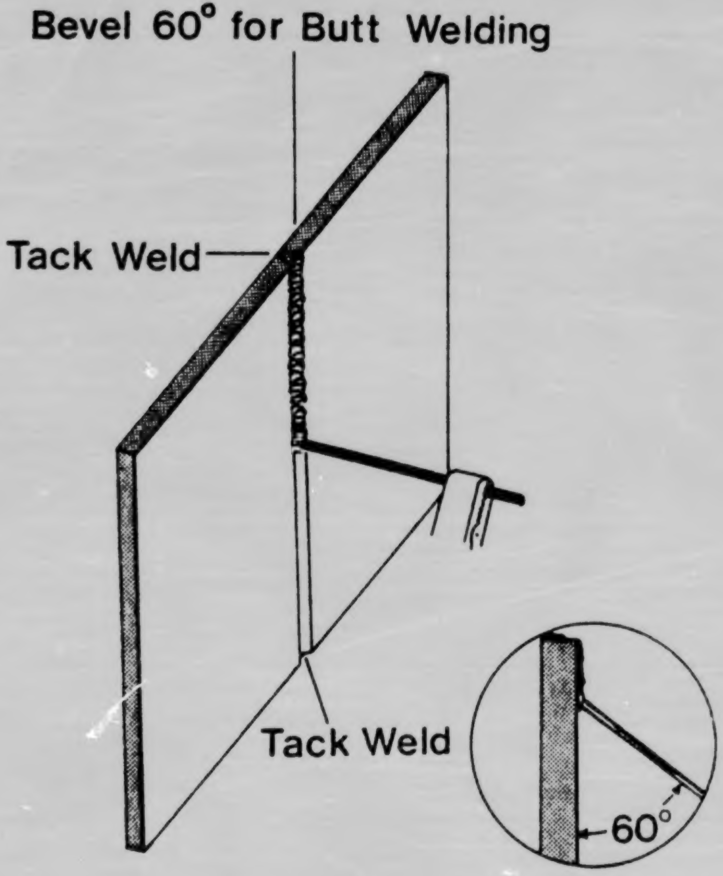
III. Procedures

- A. Prepare metal for welding
    1. Place two pieces parallel with not more than 1/16" gap. Tack both ends
    2. Position plates with joints in vertical position

       (NOTE: With 30° of perpendicular is considered vertical)
    3. Placement of plates should allow for free movement and positioning of the electrodes
- B. Weld pieces together using a single pass
    1. Amperage can be increased as much as 10 amps over that using the same electrode in vertical up position
    2. Electrode should be positioned with 60° angle formed between electrode and work in the direction of travel. Use a shorter than normal arc
    3. Run a straight stringer bead with slightly faster than normal speed of travel, yet slow enough to get good fusion and build up
- C. Chip, brush clean and cool
- D. Turn in to the instructor for a grade

Job Sheet #7

IV. Diagram of the procedure


Bevel 60° for Butt Welding
Tack Weld
Tack Weld
60°

POSITIONING WELDING
UNIT II

JOB SHEET #8 - RUNNING VERTICAL DOWN FILLET WELDS

I. Tools and equipment

   A. Welder, electrode holder, and ground clamp
   B. Gloves, helmet, and safety glasses
   C. Chipping Hammer
   D. Grinder
   E. Wire brush
   F. Pliers
   G. Rule

II. Materials

   A. Two pieces of steel plate, 2" x 4" by 3/32" to 1/8" thick
   B. E-6013 electrodes - 3/32" diameter

III. Procedure

   A. Prepare metal for welding
      1. Place two pieces together to form 90° fillet. Tack both ends leaving a slight spacing between the pieces.
      2. Position plates with joints in vertical position

         (NOTE: Within 30° of perpendicular is considered vertical)
      3. Placement of plates should allow for free movement and positioning of the electrode

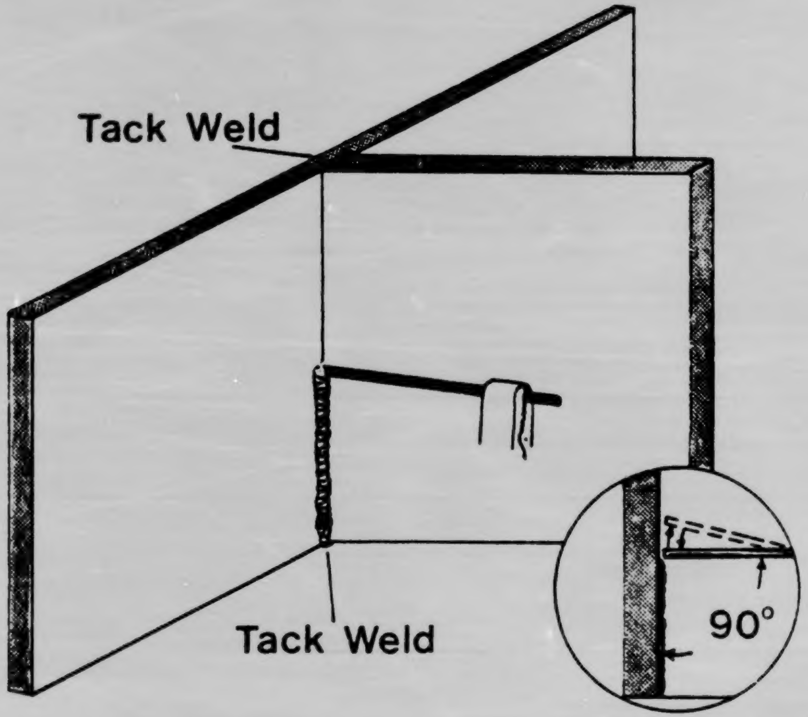
   B. Welds pieces together using a single pass
      1. Amperage can be increased as much as 10 amps over that using the same electrode in vertical up position
      2. Electrode should be positioned with 60° angle formed between electrode and work in the direction of travel. Use a shorter than normal arc. The electrode should bisect the fillet angle or when plates are of unequal thickness, point slightly towards the heavier plate
      3. Run a straight stringer bead with slightly faster than normal speed of travel, yet slow enough to get good fusion and build up

   C. Chip, brush clean and cool

   D. Turn in to instructor for grade

Job Sheet #8

IV. Diagram of the procedure


Tack Weld
Tack Weld
90°

POSITIONING WELDING
UNIT II

JOB SHEET #9 - RUNNING OVERHEAD BUTT AND FILLET WELDS

I. Tools and equipment

- A. Welder, electrode holder, and ground clamp
- B. Gloves, helmet, safety glasses and cap
- C. Chipping Hammer
- D. Grinder
- E. Wire brush
- F. Pliers
- G. Rule

II. Materials

- A. Two pieces of steel plate 2" x 4" by 1/8" to 5/32" thick
- B. E-6011 electrodes - 1/8" diameter

III. Procedure - Butt Weld

- A. Prepare metal for Butt Weld
    1. Place two pieces parallel with not more than 1/16" gap. Tack both ends
    2. Clamp pieces to overhead welding stand so they are 8-10" above head level
- B. Weld pieces together using a single stringer bead. (Butt Weld)
    1. Use one size smaller than normal electrode and a shorter than normal arc length
    2. Position the electrode so that it leans 5-10° in the direction of travel, with tip at toe of the crater
    3. Oscillate electrode ahead in direction of travel not to exceed a distance equal to diameter of electrode. Hold until deposited metal reaches heal of crater. Repeat sequence
- C. Chip, brush clean, and cool
- D. Turn in to instructor for grade

IV. Procedure - Fillet Weld

- A. Prepare metal for Fillet Weld
    1. Place two pieces of metal to form 90° Fillet and tack at both ends

2. Clamp pieces to overhead welding stand at 8-10" above head level

B. Weld pieces together using a single stringer bead

1. Use one 32nd smaller than normal electrode and a shorter than normal arc length

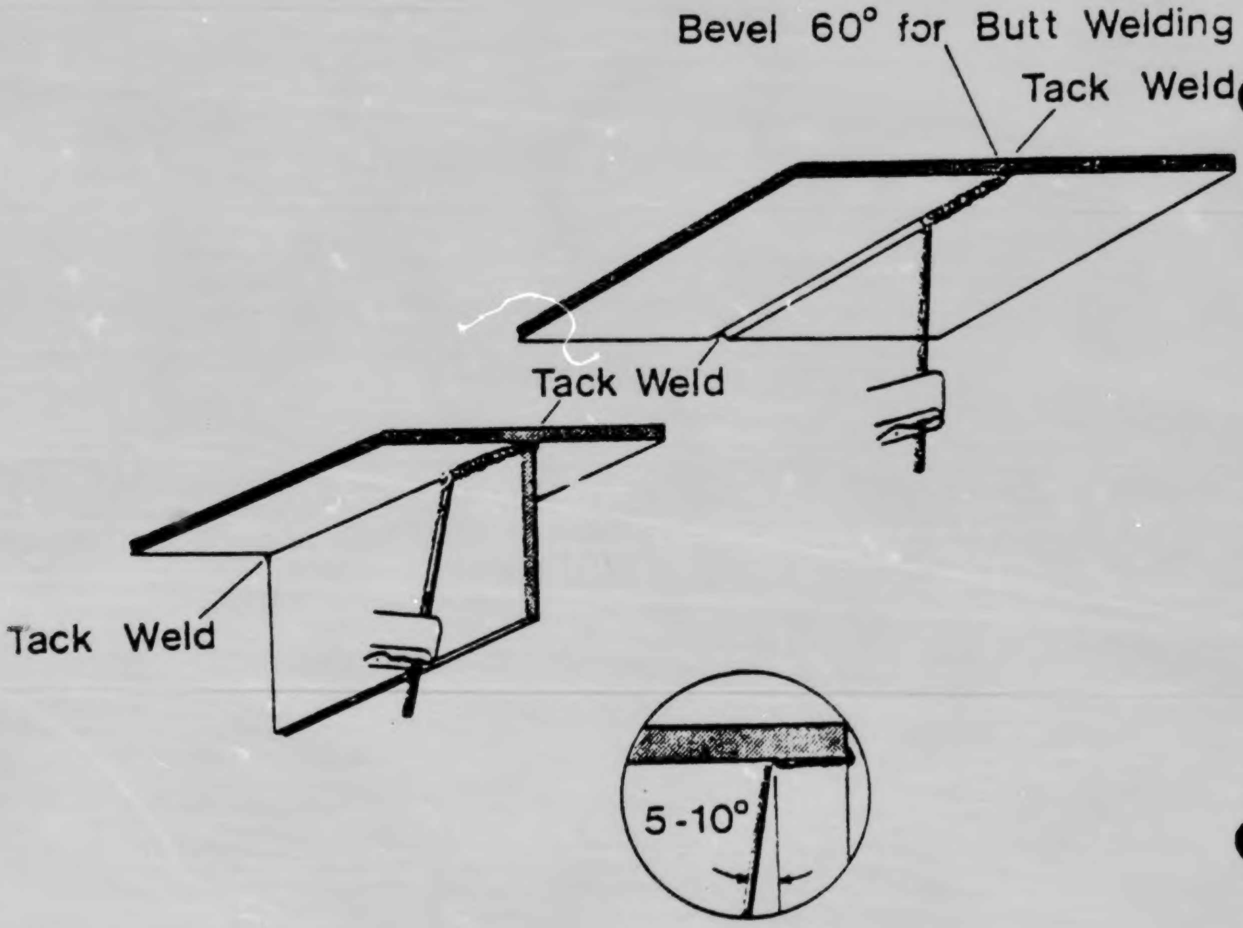
2. Position the electrode so that it leans 5-10° in the direction of travel, with tip at toe of the crater. Bisect the fillet angle and aim slightly at heavier plate if plates are of unequal thickness

3. Oscillate electrode ahead in direction of travel a distance equal to diameter of electrode. Hold until deposited metal reaches heel of crater. Repeat sequence

C. Chip, brush clean and cool

D. Turn in for a grade

V. Diagram of the procedures



POSITION WELDING
UNIT II

TEST

1. Match the following terms with their definitions

    1. Pads
    2. Horizontal position
    3. Face
    4. Root
    5. Vertical Position
    6. Penetration
    7. Undercutting
    8. Porosity
    9. Crater
    10. Fusion

    a.______Bottom surface of a fusion weld

    b.______Distance from the original surface of the base metal to that point which fusion ceases

    c.______Running a horizontal bead on a vertical surface

    d.______Exposed surface of a fusion weld

    e.______Metal plates which have beads running parallel to each other in such a way that the beads are united with one another to form a solid mass

    f.______Portion of the crater left unfilled due to excessive current and the improper movement of the electrode

    g.______Beads deposited in a vertical position on a horizontal surface

    h.______Melting metals until the molten portions unite with each other

    i.______Depression in the face of a weld

    j.______Condition caused by the oxidation of a gas pocket trapped in a weld as it solidifies

2. What four factors determine proper current adjustments?

    a.

    b.

    c.

    d.

3. Name three reasons for removing slag from a bead.

    a.

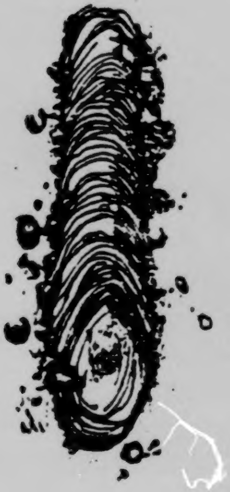
    b.

    c.

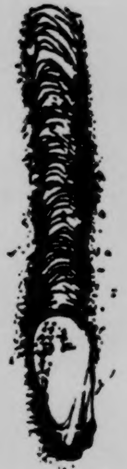
4. Name three reasons for fusing one bead in with another.
   a.
   b.
   c.

5. What are the four variables that determine weld quality?
   a.
   b.
   c.
   d.

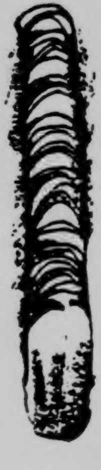
6. Identify the following examples of properly and improperly formed beads by telling what caused each one.



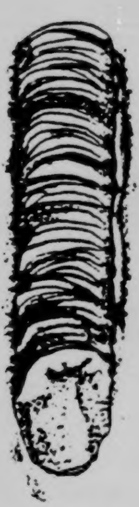
a. ________________



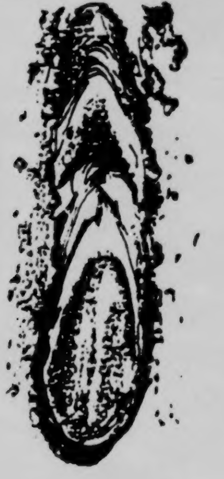
b. ________________



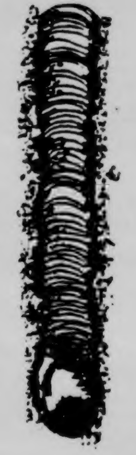
c. ________________



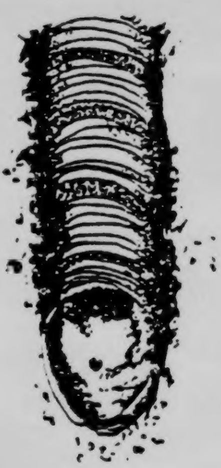
d. ________________



e. ________________



f. ________________



g. ________________

7. Performance test - Teacher developed

8. Safety Test

_____a. When looking at the arc, protect your eyes with a number (1)__5__ (2)__10__ (3)__15__ (4)__20__ shade lens

_____b. The welding area should be (1)__Clean__ (2)__dry__ (3)__free of combustibal material__ (4)__all of these__.

c. List 3 things to consider that are related to proper dress when you are welding

1. ______________________________

2. ______________________________

3. ______________________________

d. List 3 points to check on your welding equipment to be sure it is safe to operate

1. ______________________________

2. ______________________________

3. ______________________________

OXYACETYLENE FUSION WELDING
UNIT III

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to select the proper size welding tip according to manufacturer's recommendations and choose the correct filler rod for a welding job. The student should be able to demonstrate his/her ability to carry a puddle with or without a filler rod. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with oxyacetylene fusion.
2. Name five factors that determine the quality of an oxyacetylene fusion weld.
3. Indicate in writing five properties of a good weld.
4. List two factors that determine the selection of tip size in oxyacetylene welding.
5. Name two factors that determine the type of filler rod to use in oxyacetylene welding.
6. Name the purpose of the filler rod.
7. Identify the three types of oxyacetylene fusion welding flames.
8. Demonstrate the ability to perform the following jobs:
    a. Turning on, lighting, adjusting, and turning off the oxyacetylene welding unit.
    b. Constructing a corner weld without a filler rod.
    c. Laying beads on a flat plate without a filler rod.
    d. Laying beads on a flat plate with a filler rod.
    e. Construct a flat butt weld, using a filler rod.

OXYACETYLENE FUSION WELDING
UNIT III

INFORMATION SHEET

I. Terms and definitions

   A. Fusion welding - The joining of pieces of metal by heating the adjoining edges to the fusion or melting point and allowing them to flow or run together and then cool

   B. Penetration - The distance from the original surface of the base metal to that point at which fusion ceases

   C. Base metal - The metal to be welded

   D. Alloy - A mixture with metallic properties composed of two or more elements of which at least one is a metal

   E. Inner cone - The inner white part of the neutral flame

   F. Backfire - A momentary burning back of the flame into the tip, flame goes out with a loud snap or pop

   G. Flashback - A fire inside the torch indicated by a hissing or squealing sound

   H. Tack weld - A short weld used for temporarily holding material in place

II. Factors determining fusion weld quality

   A. Proper flame adjustment

   (NOTE: Proper flame adjustment welding cannot be attained unless the tip is properly cleaned.)

   B. Angle of tip

   C. Distance from work

   D. Speed of travel

   E. Movement of tip

III. Properties of a good weld

   A. Consistent width

   B. Straightness

   C. Slightly crowned

   D. Fused into base metal

   E. Clean appearance

IV. Factors determining tip size selection

- A. Metal thickness
- B. Size of welding rod

V. Factors determining filler rod selection

- A. Rod with similar properties as base metal
- B. Thickness of metal

  (NOTE: A general rule is to use a rod with a diameter equal to the thickness of the base metal)

VI. Purpose of filler rod

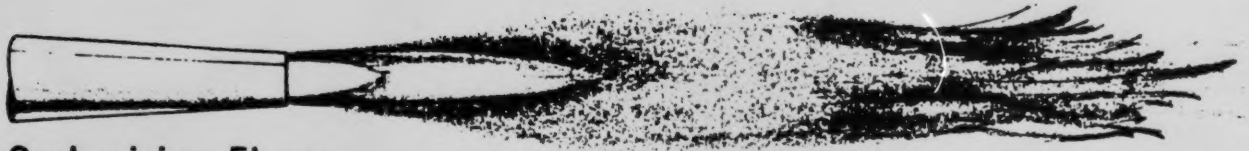
- A. To add strength to weld or joint

VII. Oxyacetylene fusion welding flames (TM 1)

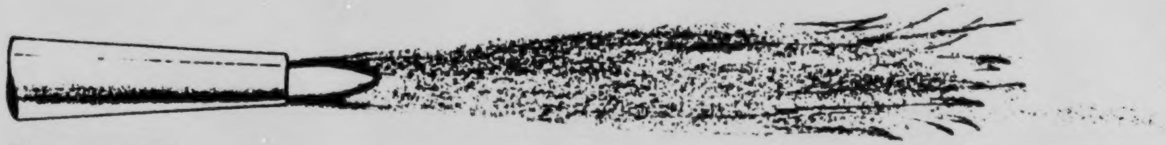
- A. Carburizing - A flame with an excess of acetylene

  (NOTE: The length of the acetylene feather is designated by X times the length of the inner cone.)
- B. Neutral - A flame with the proper ratio of oxygen and acetylene
- C. Oxidizing - A flame with an excess of oxygen

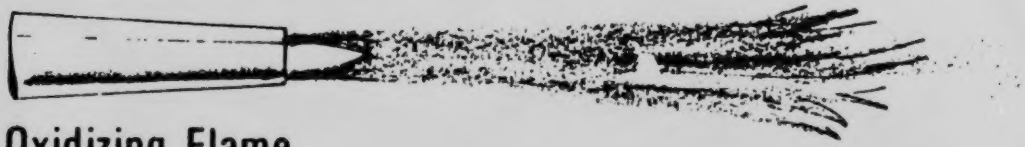
Oxyacetylene Welding Flames



Carburizing Flame

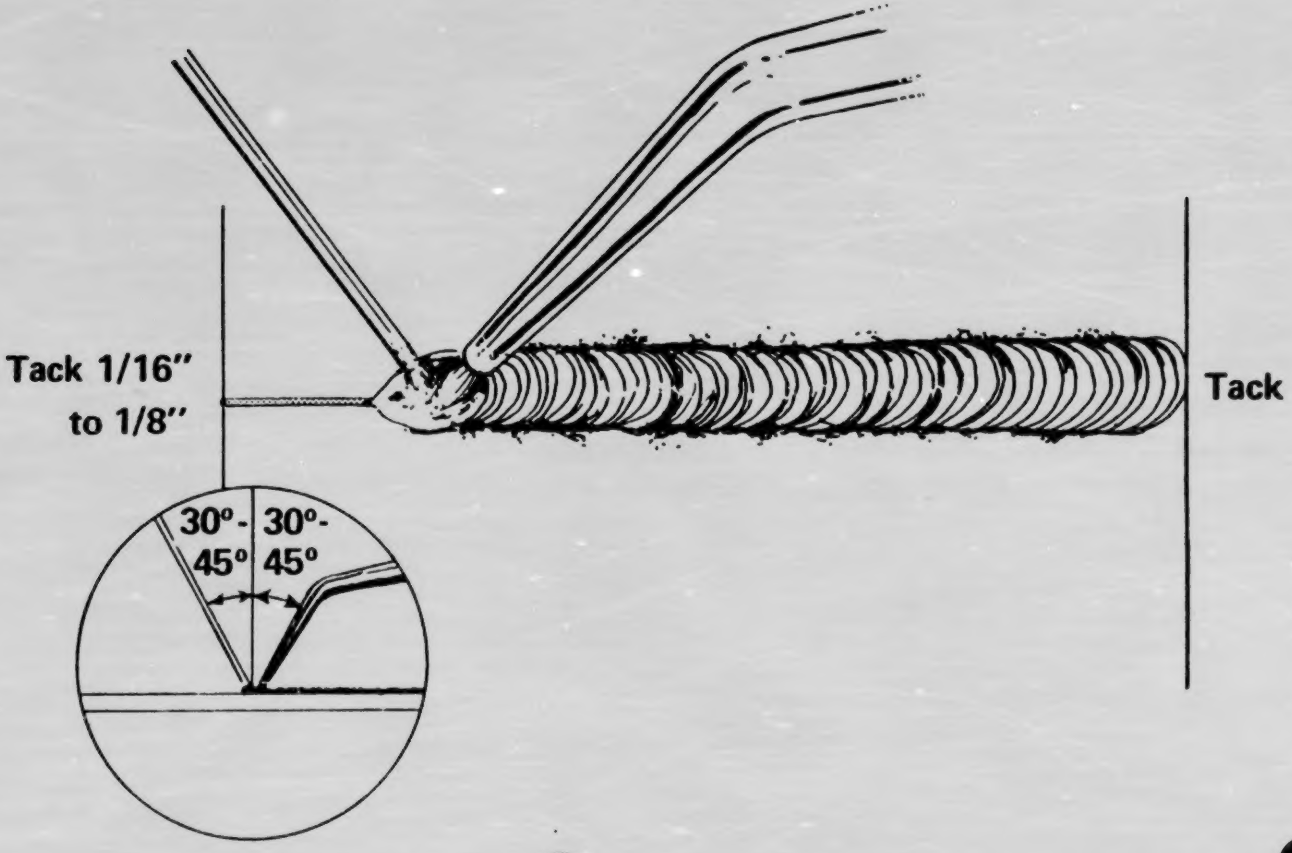


Neutral Flame

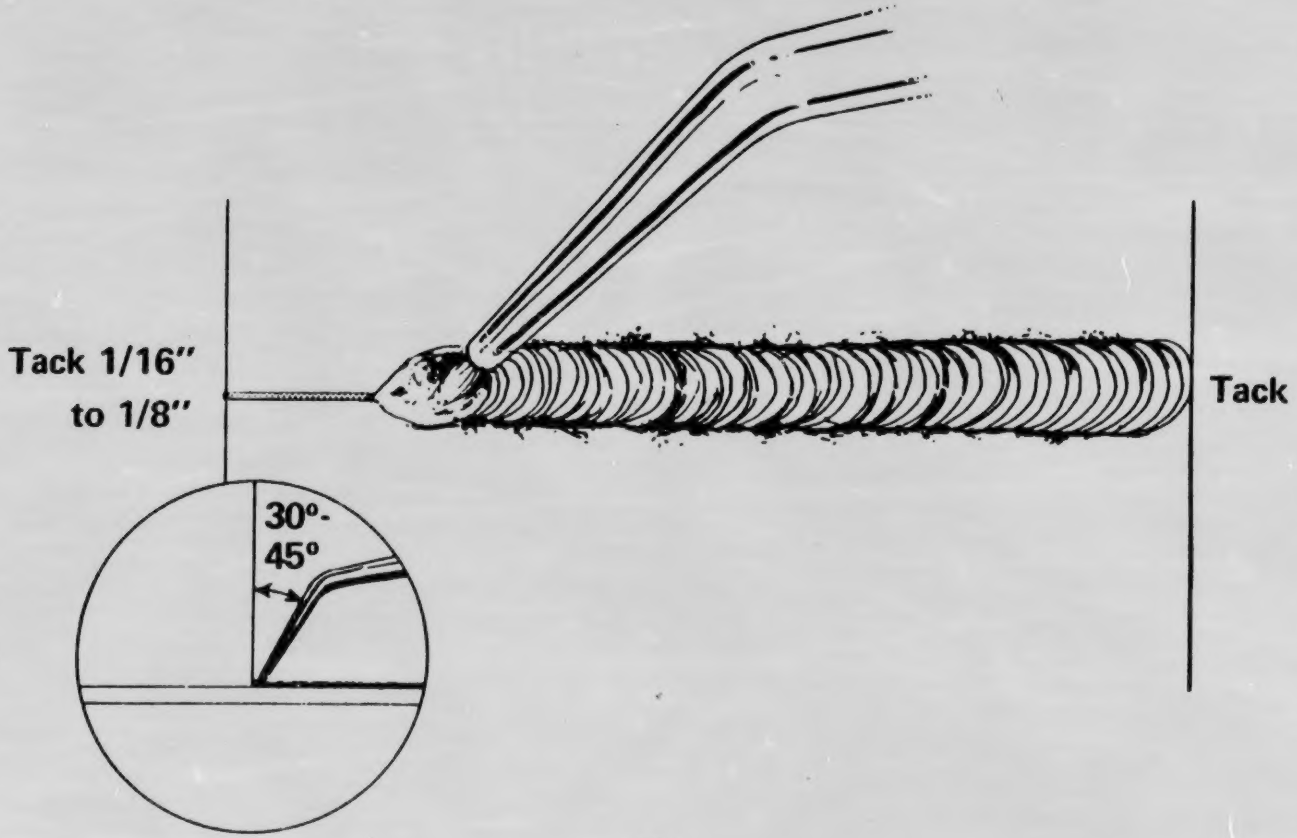


Oxidizing Flame

Laying Bead With Filler Rod


Tack 1/16" to 1/8"
Tack
30°-45°
30°-45°

Laying Bead Without Filler Rod


Tack 1/16"
to 1/8"
Tack
30°-
45°

OXYACETYLENE FUSION WELDING
UNIT III

JOB SHEET #1 - TURNING ON, LIGHTING, ADJUSTING FLAMES, AND TURNING OFF THE TORCH FOR FUSION WELDING

I. Tools and equipment

- A. Oxyacetylene apparatus
- B. Welding tip
- C. Safety glasses
- D. Flint lighter
- E. Gloves

II. Procedures for turning on and lighting

- A. Check all cylinder, regulator, and torch valves to make sure they are turned off
- B. Open acetylene cylinder valve 1/2 to 3/4 of a turn (CAUTION: Never open more than 1 1/2 turns)
- C. To purge line-open acetylene valve on torch one fourth turn
- D. Turn acetylene regulator adjusting screw clockwise until desired working pressure is reached (determined by size of tip)
- E. Close acetylene valve on torch
- F. Open oxygen cylinder valve all the way
- G. Open oxygen torch valve one turn
- H. Turn oxygen regulator adjusting screw clockwise until desired pressure is reached (determined by size of tip)
- I. Close oxygen valve on torch
- J. Open acetylene valve on torch 1/4 turn
- K. Light the torch with flint lighter and adjust until smoke on flame clears
- L. Open oxygen torch valve and adjust to a neutral flame

III. Procedures for adjusting welding torch for the three types of flames

- A. Start with a neutral flame

B. To produce a carburizing flame, reduce the supply of oxygen by slowly closing the oxygen torch valve until an excess acetylene feather is produced

C. To produce an oxidizing flame, increase the supply of oxygen by slowly opening the oxygen torch valve until a short, white inner cone is produced

IV. Procedures for turning off the torch and oxyacetylene welding unit

A. Close acetylene torch valve

B. Close oxygen torch valve

C. Close acetylene cylinder valve

D. Close oxygen cylinder valve

E. Open acetylene torch valve (when gauges reach 0, release acetylene regulator adjusting screw and close torch valve)

F. Open oxygen valve on torch (when gauges reach 0, release oxygen regulator adjusting screw and close torch valve)

G. Place torch and hoses on hanger or brackets

OXYACETYLENE FUSION WELDING
UNIT III

JOB SHEET #2 - MAKING A CORNER WELD WITHOUT A FILLER ROD

I. Tools and equipment

- A. Oxyacetylene welding unit
- B. Welding tip (according to manufacturer's recommendations)
- C. Gloves
- D. Goggles
- E. Pliers
- F. Wire brush
- G. Flint lighter
- H. Fire brick

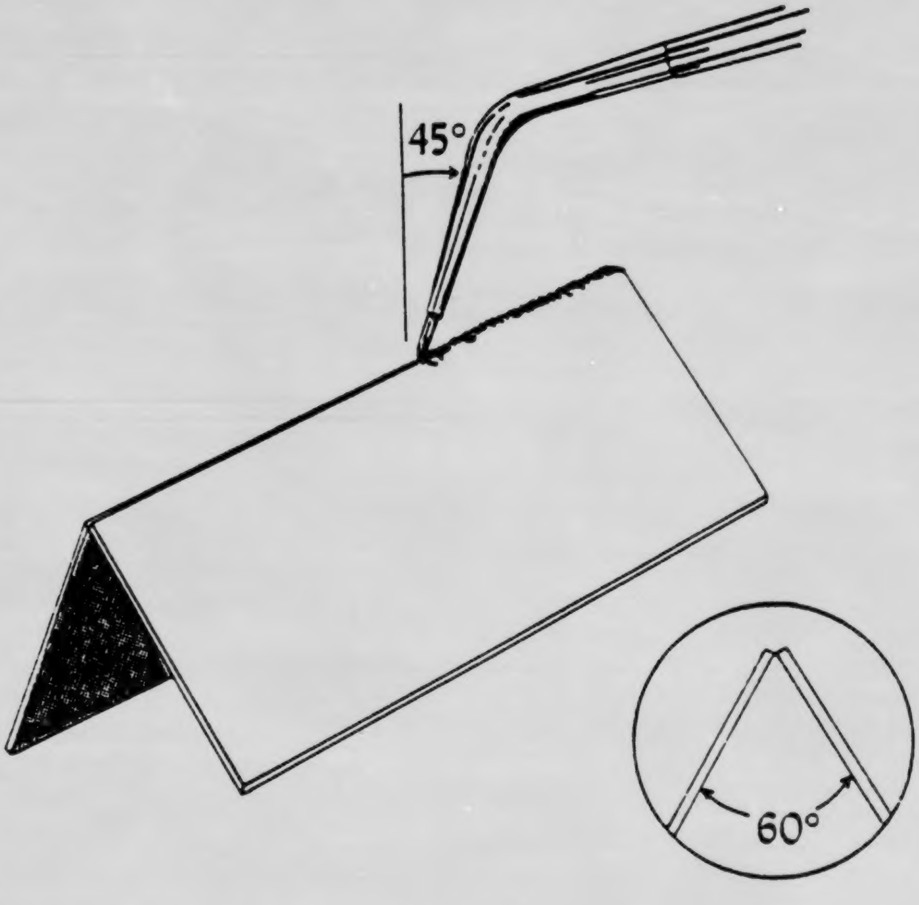
II. Materials - Two pieces of mild steel strips, 16 gauge 1 1/4" by 6"

III. Procedures

- A. Prepare metal for welding
- B. Place metal in welding position (see Figure A)
- C. Turn on oxyacetylene unit
- D. Set working pressure (according to manufacturer's recommendations)
- E. Light torch and adjust to an oxidizing flame
- F. Tack weld metal in position
- G. Place inner cone about 1/16" to 1/8" from plate
- H. Do not begin travel until you have established a molten puddle
- I. Begin welding at right end
- J. Hold tip vertically at 45° angle from direction of travel
- K. Slowly weave flame from side to side across the weld
- L. Repeat process until instructor gives permission to go on to next job

IV. Diagram of the procedure

Figure A



OXYACETYLENE FUSION WELDING
UNIT III

JOB SHEET #3 - LAYING BEADS ON FLAT PLATE WITHOUT FILLER ROD

I. Tools and equipment

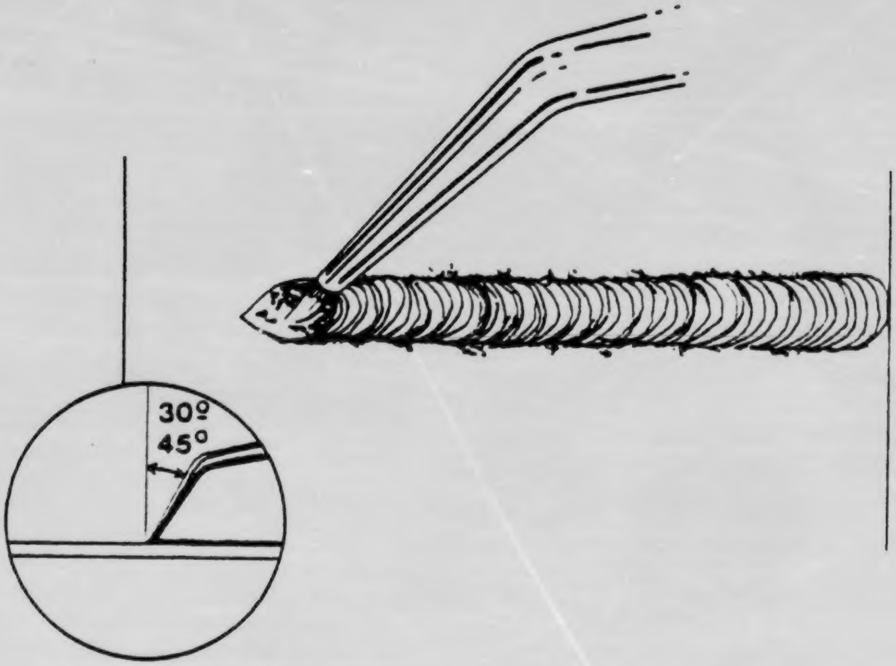
- A. Oxyacetylene welding unit
- B. Welding tip (according to manufacturer's recommendations)
- C. Gloves
- D. Goggles
- E. Pliers
- F. Wire brush
- G. Flint lighter
- H. Fire brick

II. Material - One piece of mild steel strip, 1/8" thick by 4" by 6"

III. Procedures

- A. Prepare metal for welding
- B. Place metal in welding position
- C. Turn on oxyacetylene unit
- D. Set working pressure (according to manufacturer's recommendations)
- E. Light torch and adjust to a neutral flame
- F. Place inner cone about 1/16" to 1/8" from plate
- G. Do not begin travel until you have established a molten puddle
- H. Hold torch 30° to 45° from center in direction of travel
- I. Slowly move the torch forward allowing the metal to melt
- J. Repeat process until instructor gives permission to go on to next job

IV. Diagram of the procedure



OXYACETYLENE FUSION WELDING
UNIT III

JOB SHEET #4 - LAYING BEADS ON FLAT PLATE WITH FILLER ROD

I. Tools and equipment

- A. Oxyacetylene welding unit
- B. Welding tip (according to manufacturer's recommendations)
- C. Gloves
- D. Goggles
- E. Pliers
- F. Wire brush
- G. Flint lighter
- H. Fire brick

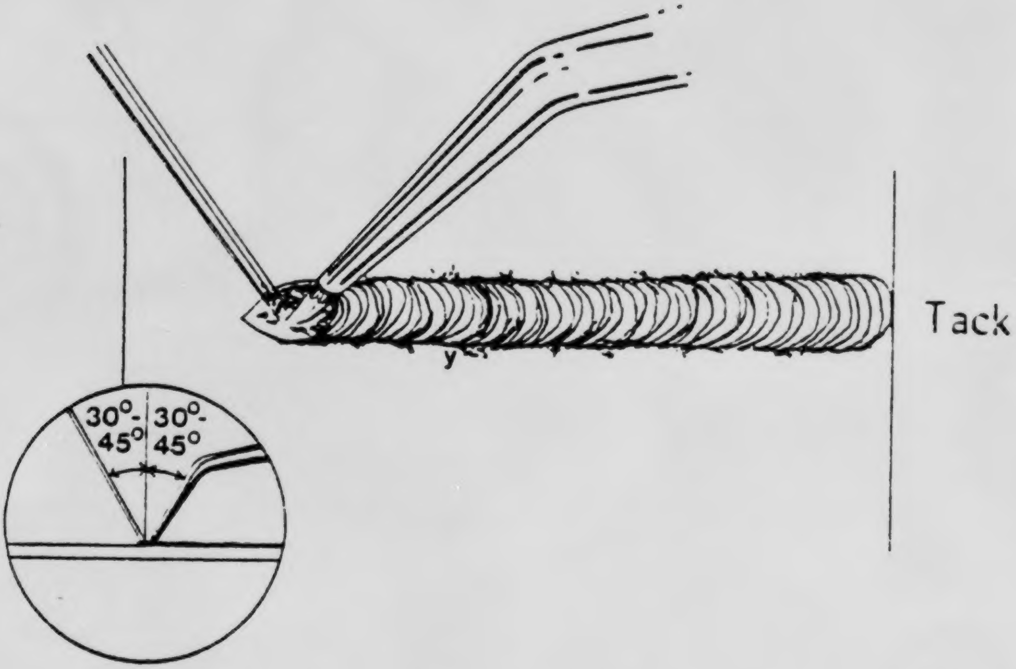
II. Material

- A. One piece of mild steel strip, 16 gauge 1 1/4" by 6"
- B. Filler rod mild steel (according to manufacturer's recommendations)

III. Procedures

- A. Prepare metal for welding
- B. Place metal in welding position
- C. Turn on oxyacetylene unit
- D. Set working pressure (according to manufacturer's recommendations)
- E. Light torch and adjust to a neutral flame
- F. Hold torch 30° to 45° from center
- G. Place inner cone about 1/16" to 1/8" from surface of puddle
- H. Do not begin travel until you have established a molten puddle
- I. Add filler rod to puddle in front of torch
- J. Move puddle forward with torch and allow puddle to form in base metal
- K. Add rod and withdraw rod as you move puddle forward
- L. Keep puddle the same size and shape the entire length of the bead
- M. Show bead to instructor when completed

IV. Diagram of the procedure


Tack
y
30°-
45°
30°-
45°

OXYACETYLENE FUSION WELDING
UNIT III

JOB SHEET #5 - WELDING BUTT JOINTS WITH FILLER ROD

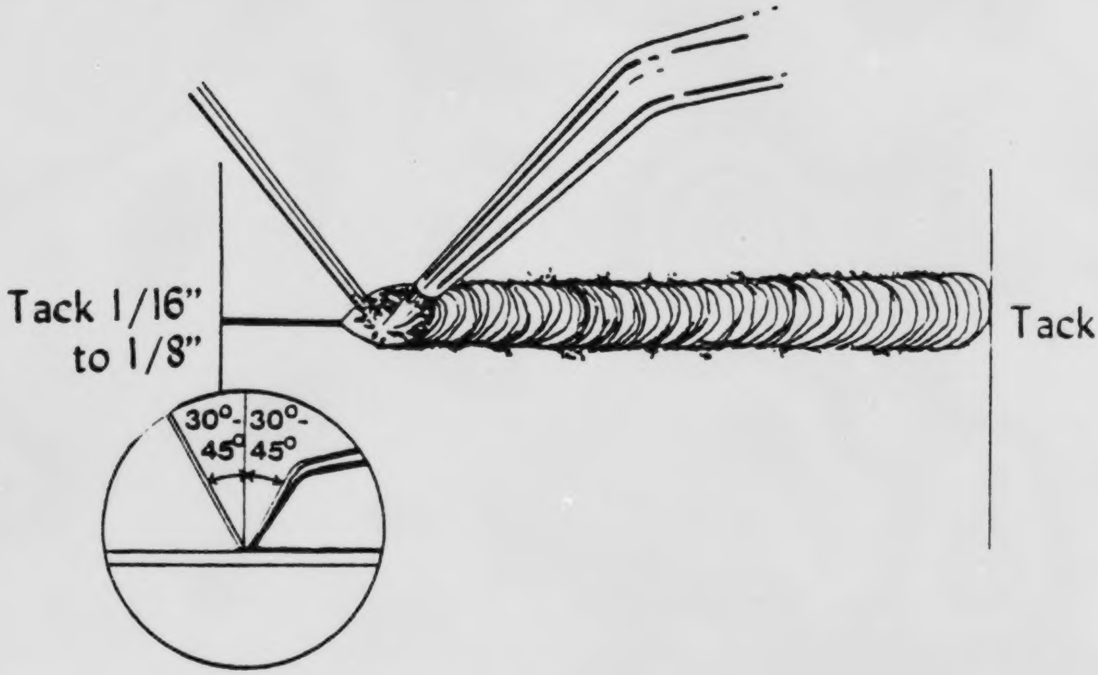
I. Tools and equipment

- A. Oxyacetylene welding unit
- B. Welding tip (according to manufacturer's recommendations)
- C. Gloves
- D. Goggles
- E. Pliers
- F. Wire brush
- G. Flint lighter
- H. Fire brick

II. Materials

- A. Two pieces of mild steel strips, 16 gauge 1 1/4" by 6"
- B. Filler rod mild steel (according to manufacturer's recommendations)
- C. Turn on oxyacetylene unit
- D. Set working pressure (according to manufacturer's recommendations)
- E. Light torch and adjust to a neutral flame
- F. Tack weld metal together
- G. Hold torch 30° to 45° from center
- H. Do not begin travel until you have established a molten plate
- I. Place inner cone about 1/16" to 1/8" from surface of puddle
- J. Add filler rod to puddle in front of torch
- K. Move puddle forward with torch and allow puddle to form in base metal
- L. Add rod and withdraw rod as you move puddle forward
- M. Keep puddle the same size and shape the entire length of the bead

IV. Diagram of the procedure


Tack 1/16"
to 1/8"
Tack
30°-
45°
30°-
45°

OXYACETYLENE FUSION WELDING
UNIT III

TEST

1. Define the following terms:

   a. Inner cone -

   b. Penetration -

   c. Backfire -

   d. Fusion welding -

   e. Tack weld -

2. What are five factors that determine the quality of an oxyacetylene fusion weld?

   a.

   b.

   c.

   d.

   e.

3. Name five properties of a good weld.

   a.

   b.

   c.

   d.

   e.

4. What are the two factors that determine the selection of tip size in oxyacetylene welding?

   a.

   b.

5. List two factors that determine the type of filler rod to use in oxyacetylene welding.

   a.

   b.

8. Performance tests will be given on the following tasks:
   a. Turning on, lighting, adjusting, and turning off the oxyacetylene welding unit
   b. Constructing a corner weld without a filler rod
   c. Laying beads on a flat plate with and without a filler rod
   d. Constructing a flat butt weld, using a filler rod

OXYACETYLENE BRAZING
UNIT IV

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to distinguish between braze and fusion welding and be able to list advantages and disadvantages of brazing. The student should be able to demonstrate the procedures for applying flux to a filler rod and construct a butt weld using the brazing process. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with brazing.
2. Discuss in writing the difference between braze and fusion welding.
3. List three advantages of brazing.
4. List two disadvantages of brazing.
5. Indicate in writing two reasons for having a clean metal surface before brazing.
6. Name one way of removing oxides from a clean metal surface.
7. Name five purposes of flux.
8. Demonstrate the procedures for performing the following.
    a. Adding flux to filler rod
    b. Constructing a brazing butt weld joint

OXYACETYLENE BRAZING
UNIT IV

INFORMATION SHEET

I. Terms and definitions

- A. Brazing - The uniting of two pieces of metal together to form one piece by the use of a bronze rod and flux
- B. Malleability - A property of metals which allows them to be bent or permanently distorted without rupture
- C. Ductile - A term describing metal which is capable of being drawn or stretched out
- D. Tinning operation - The melting of a small amount of bronze rod onto the surface and allowing it to spread along the entire seam
- E. Flux - A chemical used to clean metals during the welding process

II. Braze and fusion welding

- A. Brazing - The laying of a thin coat of bronze along top of seam
- B. Fusion - The melting of metals until the molten portions unite with each other

III. Advantages of brazing

- A. Main characteristics of base metal not destroyed
- B. Less gas consumed
- C. Can be used on thin metals
- D. Used on malleable castings
- E. May be used in joining different kinds of metals

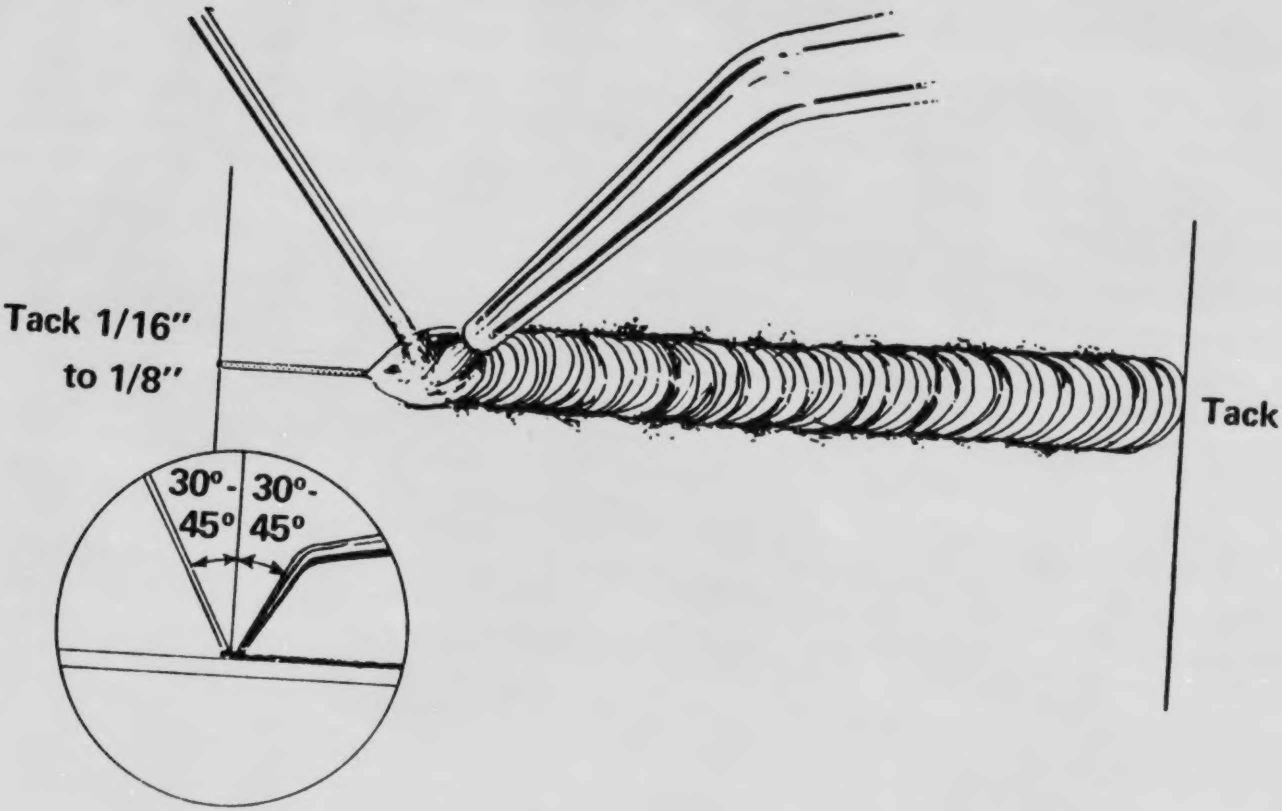
IV. Disadvantages of brazing

- A. Cannot be used on metal where stress is a factor
- B. Cannot be used where working temperature of the part is over 500°F
- C. Expensive to use

V. Reasons for clean metal surface

- A. Bronze will stick easier
- B. Allows bronze to flow smoothly and evenly over entire weld area

Brazing a Butt Joint


Tack 1/16"
to 1/8"
Tack
30°-
45°
30°-
45°

OXYACETYLENE BRAZING
UNIT IV

JOB SHEET #1 - BRAZING A BUTT JOINT

I. Tools and equipment

A. Oxyacetylene welding unit

B. Gloves

C. Safety glasses

D. Goggles

E. Welding tip (according to manufacturer's recommendations)

F. Wire brush

G. Flint lighter

H. Fire brick

II. Materials

A. Two pieces of mild steel strips, 1/8" thick, 1 1/4" by 6"

B. Bronze filler rod (use according to manufacturer's recommendations)

C. Welding flux or flux-coated welding rod

III. Procedures

A. Prepare metal for brazing - clean

B. Place metal in brazing position - 1/16" to 1/8" apart

C. Turn on oxyacetylene unit

D. Adjust proper working pressure of oxygen and acetylene (use manufacturer's recommendations)

E. Place metal on fire brick (NOTE: Do not lay metal flat on brick; arrange metal so a small space will be between the base metal and the fire brick.)

F. Light and adjust torch to a slightly oxidizing flame

G. Preheat the end of the brazing rod and dip in the flux or use fluxed rod

H. Tack metal in place

I. Heat the surface of the weld area slightly

J. Hold torch 30° to 45° from the center

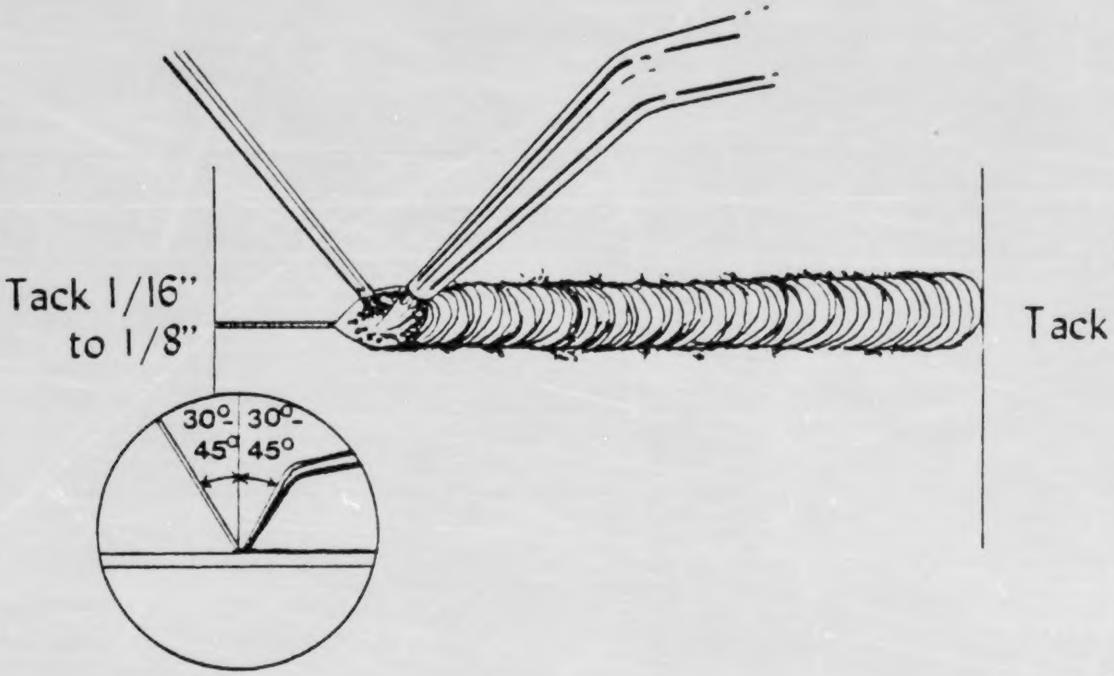
K. Melt a small amount of bronze rod onto the surface and allow it to spread along the entire seam when a cherry-red color occurs

L. When the base metal is tinned sufficiently, start depositing the proper size bead

M. Watch for base metal color (NOTE: When metal is not hot enough, the bronze will form into drops; when metal is too hot, bronze tends to boil.)

N. Complete the weld and practice doing others

IV. Diagram of the procedure



OXYACETYLENE BRAZING
UNIT IV

TEST

1. Define the following terms:
   a. Flux -
   b. Ductile -
   c. Malleability -
   d. Brazing -
   e. Tinning operation -

2. In what way is brazing different from fusion welding?

3. Name three advantages of brazing.
   a.
   b.
   c.

4. Write two disadvantages of brazing.
   a.
   b.

5. Name two reasons for having a clean metal surface before brazing.
   a.
   b.

6. How would you remove oxides from a clean metal surface?

7. Name five purposes of a flux.
   a.
   b.
   c.
   d.
   e.

8. Performance tests will be given on the following jobs.
   a. Adding flux to a filler rod
   b. Brazing a butt joint

FIGURING BILLS OF MATERIALS
UNIT V

TERMINAL OBJECTIVES

After completion of this unit the student should be able to figure bills of materials. The student should be able to distinguish between board feet and running feet and demonstrate the procedures for calculating them. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define four terms associated with bills of materials.
2. Name the unit of measure for selling lumber.
3. Indicate in writing the basic measurements in width and length that most lumber is sold by.
4. Name two ways in which metal is usually sold.
5. Write the formula for figuring board feet.
6. List the specifications needed for writing a bill of materials.
7. Recognize symbols used in selecting lumber.
8. Write the formula used in calculating the cost of lumber.
9. Write the formula used in calculating the cost of steel.
10. Calculate problems determining board feet.
11. Calculate problems determining the cost of steel.

FIGURING BILLS OF MATERIALS
UNIT V

INFORMATION SHEET

I. Terms and definitions

   A. Bill of material - An itemized list of the number of pieces needed and the dimensions of each for the construction of a project.

   B. Board foot - A piece of lumber one inch thick, 12 inches wide and 12 inches long

   C. Running foot - The foot length of material regardless of the thickness and the width

   D. Surfaced lumber - The lumber that has been dressed by running through a planer

   E. Rough stock - The lumber that has been sawed but not planed; thicker and wider

   F. Square foot - Equal to a twelve by twelve surface

   G. Cubic foot - A twelve by twelve by twelve surface

   H. A square - Equal to a 100-square-foot

II. Selling lumber

   A. Measured in board foot

   B. Priced on a basis of 1,000 board feet

III. Types of lumber dimensions

   A. Width

      1. 4 inches
      2. 6 inches
      3. 8 inches
      4. 10 inches
      5. 12 inches

   B. Length

      1. 6 feet
      2. 8 feet
      3. 10 feet
      4. 12 feet
      5. 14 feet

IV. Metal sold by

  A. Square foot

  B. Weight converted to feet

V. Formula for figuring board feet

  A. $\frac{\text{No. of pieces by thickness in in. by width in in. by length in ft.}}{\text{divided by 12}}$

  B. Example

    1. One board 1" thick by 4" wide by 12' long

    2. $\frac{1 \times 1'' \times 4'' \times 12'}{12}$ = 4 board feet

VI. Specifications required for writing a bill of material

  A. Easy understanding

  B. Number of pieces

  C. Kind of material (lumber, steel, etc.)

  D. Dimensions

  E. Finish

  F. Amount (board feet, square feet, squares, etc.)

  g. Calculation of cost per piece

  H. Examples of procedures

    1.

Pieces	Kind of Material	Dimension	Finish	Amount	Cost per Piece
3	White Pine	1" x 12" x 10'	S2S	30 Bd. Ft	$1.10

    2.

Pieces	Dimension	Kind of Material	Use
2	2" x 4" x 24'	Pine	Rafters

VII. Lumber symbols

  A. S1S - Surfaced on one side

  B. S2S - Surfaced on two sides

  C. S1E - Surfaced on one edge

  D. S2E - Surfaced on two edges

  E. S4S - Surfaced on four sides

VIII. Calculating the cost of lumber

A. Figure board feet of one piece

B. Multiply this number by the cost per thousand

C. Point off three places

D. Example - One board 2" x 8" x 12' at $60.00 per M (1,000 board feet)

E. $\frac{1 \times 2'' \times 8'' \times 12'}{12} = 16$ board feet

16 bd. ft. by $60.00 = .96 cents

IX. Calculating the cost of steel

A. Pipe and Square tubing

$$\text{Number of Pieces} \times \frac{\text{Length in ft.}}{100} \times \text{Price/CFT} = \text{Value or Cost}$$

Example:

$$12 \times \frac{30' \text{ of } 1'' \text{ pipe}}{100} \times \$55.00\text{/CFT} = 3.60 \text{ units} \times \$55.00 = \$198.00$$

B. Structural Steel - Plates, flats, strips, rounds, bars, angles, channels, etc.

$$\frac{\text{Amount in number of units} \times \text{Weight in pounds/units}}{100} \times \text{Price/CWT} = \text{Value or cost}$$

Example:

$$\frac{145' \text{ of } 2 \times 2 \times 3/16'' \text{ angle} \times 2.44\#\text{/ft.}}{100} \times \$23\text{/CWT} = \$81.38$$

FIGURING BILLS OF MATERIALS
UNIT V

ASSIGNMENT SHEET #1 - CALCULATING BOARD FEET

Calculate the total board feet in each

Formula $$\frac{\text{Pieces x Thickness x Width x Length}}{12}$$

1. 1--1" by 10" by 10' =

2. 1--1" by 4" by 14' =

3. 1--2" by 6" by 8' =

4. 1—2" by 8" by 10' =

5. 2--2" by 4" by 8' =

6. 5--1" by 8" by 8' =

7. 10--4" by 6" by 10' =

8. 1--2" by 4" by 18' =

9. 7--10" by 12" by 20' =

10. 3—1" by 2" by 6' =

FIGURING BILLS OF MATERIALS
UNIT V

ASSIGNMENT SHEET #2 - CALCULATE THE COST OF STEEL

Calculate the cost of steel in each of the problems listed below.

Formula for pipe and square tubing costs:

$$\frac{\text{Length in ft.}}{100} \times \text{Price/CFT} = \text{Cost or value of material}$$

1. 8pc.--20' lengths of 1" square tubing priced at $48/CFT

2. 2pc.--20' lengths at 3" 1D pipe priced at $255/CFT

Formula for structural steel costs:

$$\frac{\text{Amount in units x wgt./unit}}{100} \times \text{Price/CWT} = \text{Cost or value}$$

3. 375' of 2 1/2" x 2 1/2" x 1/4" angle priced at $31/CWT;
   Angle weighs 4.1#/ft.

4. 40 sq. ft. of 1/8" flat priced at $30.50/CWT;
   Flat weighs 5.1#/sq ft.

5. 105 ft. of 3/8" round priced at $50/CWT;
   3/8" round weighs 0.376#/ft.

FIGURING BILLS OF MATERIALS
UNIT V

TEST

1. Define the following terms.
   a. Board foot -

   b. Running foot -

   c. Bill of material -

   d. Surfaced lumber -

2. What is the unit of measure for selling lumber?

3. Write the common dimensions of lumber in width and length.

Width	Length
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.

4. Name two ways in which metal is usually sold.
   a.
   b.

5. Write the formula for figuring board feet.

6. What are the specifications required for writing a bill of material?
   a.
   b.
   c.
   d.
   e.
   f.
   g.

7. Match the terms on the left with the statements on the right.

a.______S1S

b.______S2S

c.______S1E

d.______S2E

e.______S4S

1. Lumber that has been surfaced on two sides
2. Lumber that has been surfaced on two edges
3. Lumber that has been surfaced on one side
4. Lumber that has been surfaced on one edge
5. Lumber that has been surfaced on four sides

8. Write the formula used in calculating the cost of lumber.

9. Write the formulas used in calculating the cost of steel.

a.

b.

10. Determine the board feet in the following problems.

a. 3 - 2" x 4" x 12' =

b. 1 - 1" x 4" x 10' =

c. 15 - 2" x 10" x 20' =

d. 6 - 4" x 4" x 10' =

INTRODUCTION TO PLUMBING
UNIT VI

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to identify pipe and pipe fittings. The student should be able to demonstrate the proper procedures for threading, reaming, and cutting pipe. These skills should be adapted to his or her own farm, and home, and community. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define five terms associated with plumbing.
2. Name and give the use of five different kinds of pipe.
3. Identify ten common pipe fittings.
4. List two reasons for using threading compounds.
5. Identify five tools used in plumbing.
6. Name four reasons for using cutting oil.
7. Indicate in writing five common sizes of pipe used in plumbing.
8. Distinguish between bolt and pipe threads.
9. Indicate in writing how pipe and bolts are measured in order to determine diameter.
10. Determine pipe length and thread length.
11. Demonstrate the proper procedures for performing the following jobs:
    a. Cutting pipe
    b. Reaming pipe
    c. Threading pipe

INTRODUCTION TO PLUMBING
UNIT VI

INFORMATION SHEET

I. Terms and definitions

- A. Plumbing - The piping and pipe attachments used to carry water into buildings and to drain away sewage and waste
- B. Soil pipes - The large pipes used to carry sewage
- C. Fittings - The pieces used to join pipe, to provide openings in pipes, and to change the direction of pipes
- D. Trap - A water-sealed bend or chamber in a waste pipe
- E. House drain - A pipe which carries all the sewage from the house
- F. Stack - A soil, waste, or ventilating pipe
- G. Fixtures - The appliances connected to the plumbing
- H. Septic tank - A tank which receives all the sewage piped into it and allows the process of sewage treatment to take place
- I. Lateral pipe - A pipe which drains the liquid from the septic tank to the soil

II. Kinds of pipe

- A. Black - Used for natural and L.P. gas, oil, and air lines
- B. Galvanized - Used for water lines
- C. Copper tubing - Used in water, refrigeration, and waste systems
- D. Cast iron - Used in sewage systems
- E. Brass or lead - Used for traps and drains
- F. Plastic - Used in water systems
- G. PVC - Used in a water or sewage system (plastic pipe)
- H. Soil - Used in a sewage system (cast iron pipe)

III. Pipe fittings (Transparencies 1 and 3)

- A. Elbow
- B. Street elbow
- C. Reducer

D. Coupling
E. Nipple
F. Tee
G. Union
H. Bushing
I. Cap
J. Plug
K. Floor flange
L. Cross
M. "Y"
N. Globe valve
O. Gate valve
P. Gas stop

IV. Reasons for using threading compounds
  A. Insures tight joints
  B. Prevents threads from rusting

V. Tools used in plumbing (Transparency 2)
  A. Stock and die
  B. Pipe vise
  C. Reamer
  D. Pipe wrench
  E. Pipe cutter
  F. Hack saw
  G. Taper triangular file

VI. Reasons for using cutting oil on tools
  A. Cuts smoother
  B. Cuts easier
  C. Lasts longer
  D. Removes burrs from dies

VII. Common sizes of pipe used in plumbing

- A. 1/4"
- B. 1/2"
- C. 3/4"
- D. 1"
- E. 1 1/4"

VIII. Threads

- A. Pipe - Tapered 1/16" per inch

  (NOTE: Pipe has standard threads.)
- B. Bolt - Straight threads
  1. National coarse
  2. National fine

IX. Diameter measurements

- A. Pipe - Inside
- B. Bolt - Outside

X. Estimating and measuring pipe length

(NOTE: It is necessary to make allowances for threads and for fitting projections when measuring for threaded pipes.)

- A. Pipe replacements
  1. Measure the distance from face of one fitting to face of other fitting (Transparency 4)
  2. Add the length of pipe that will enter the fitting at each end

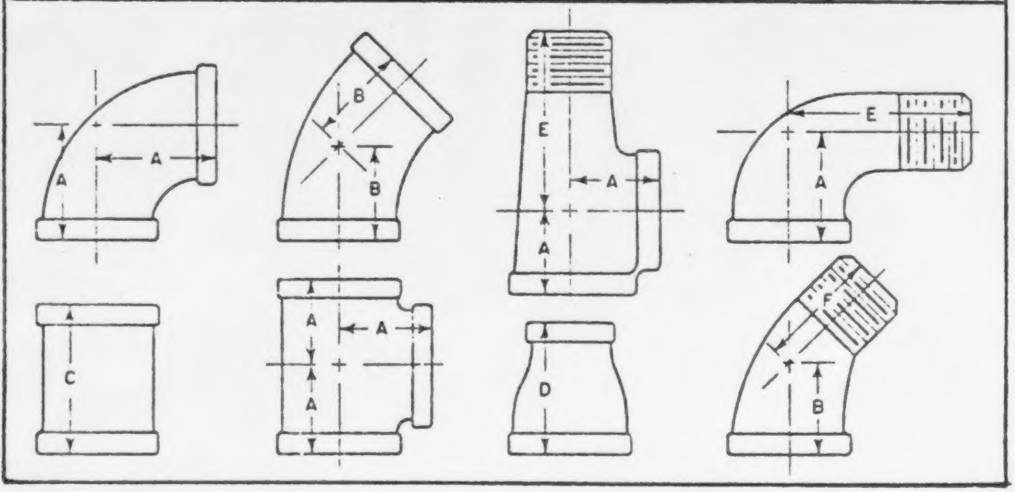
     (NOTE: The length of the thread for each end of the pipe should be determined from the Supplemental Information. The amount of thread cut on a pipe varies as to size of pipe. Since pipe threads are tapered, this has an effect upon how far the thread enters the fitting.)
- B. New pipe installations
  1. Measure the distance from center line of one fitting to center line of other fitting (Transparency 4)
  2. Determine the amount of pipe needed to go into the fittings at each end of pipe (See Supplemental Information)
  3. Determine the distance from center line of the fitting to the face for each fitting (Transparency 4)

     (NOTE: Center to face distance varies according to the type of fitting; example: elbow, straight tee, union)
  4. The length of new pipe = center to center distance + amount needed to go into fittings at each end - center to face of fitting distances

SUPPLEMENTAL INFORMATION

STANDARD MALLEABLE FITTINGS

Nominal Size (in.)	General Dimensions (inches)					
	A	B	C	D	E	F
1/8	11/16	11/16	15/16	—	1	13/16
1/4	13/16	3/4	1 1/16	1	1 3/16	15/16
3/8	15/16	13/16	1 3/16	1 1/8	1 7/16	1
1/2	1 1/8	7/8	1 5/16	1 1/4	1 5/8	1 1/8
3/4	1 5/16	1	1 1/2	1 1/2	1 7/8	1 5/16
1	1 1/2	1 1/8	1 11/16	1 11/16	2 1/8	1 7/16
1 1/4	1 3/4	1 5/16	1 15/16	2 1/16	2 7/16	1 11/16
1 1/2	1 15/16	1 7/16	2 1/8	2 5/16	2 11/16	1 7/8
2	2 1/4	1 11/16	2 1/2	2 13/16	3 1/4	2 1/4
2 1/2	2 11/16	1 15/16	2 7/8	3 1/4	3 7/8	—
3	3 1/16	2 3/16	3 3/16	3 11/16	4 1/2	—



STEEL AND WROUGHT - IRON PIPE DATE*

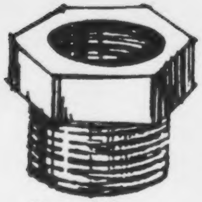
Nom. Pipe Size	Outside Diam.	Standard Inside Diam.	Standard Weight Lb. Per Ft.	Extra Strong Inside Diam.	Extra Strong Weight Lb. Per Ft.	Threads Per Inch	Tap Drill Size	Hole Size **	Length of Thread	Dist. Pipe Goes into fitting
1/8	0.405	0.269	0.24	0.215	0.31	27	5/16	[illegible]	13/32	1/4
1/4	0.540	0.364	0.42	0.302	0.53	18	7/16	9/16	5/8	3/8
3/8	0.675	0.493	0.57	0.423	0.74	18	19/32	11/16	5/8	3/8
1/2	0.840	0.622	0.85	0.546	1.09	14	23/32	7/8	13/16	1/2
3/4	1.050	0.824	1.13	0.742	1.47	14	15/16	1 1/16	7/8	1/2
1	1.315	1.049	1.68	0.957	2.17	11 1/2	1 3/16	1 11/32	1 1/32	9/16
1 1/4	1.660	1.380	2.27	1.278	3.00	11 1/2	1 15/32	1 11/16	1 1/16	5/8
1 1/2	1.900	1.610	2.72	1.500	3.63	11 1/2	1 23/32	1 15/16	1 1/16	11/16
2	2.375	2.067	3.65	1.937	5.04	11 1/2	2 3/16	2 7/16	1 1/8	3/4
2 1/2	2.875	2.469	5.79	2.323	7.66	8	2 5/8	2 15/16	1 3/8	7/8
3	3.500	3.068	7.58	2.900	10.25	8	3 1/2	3 9/16	1 11/16	13/16

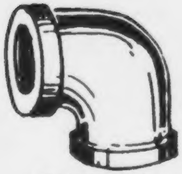
*All measurements are stated in fractional or decimal inches.

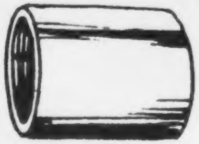
**Size of hole to drill to insert pipe through walls, floors, and other materials.

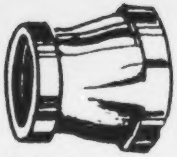
From "The Farm Shop"

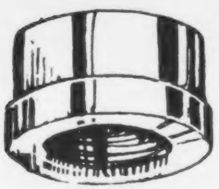
Pipe Fittings

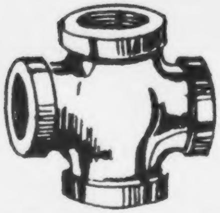

Bushing

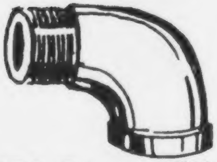

90º Elbow

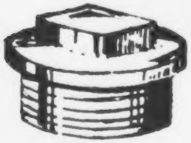

Coupling

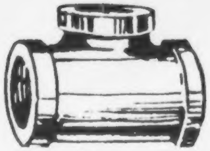

Bell Reducer

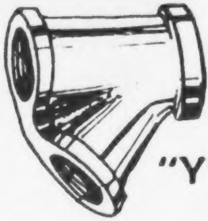

Cap

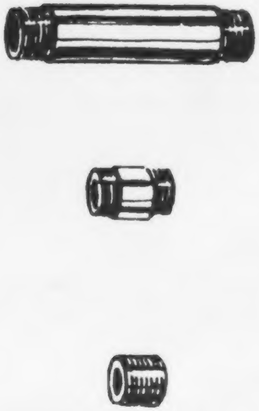

Straight Cross

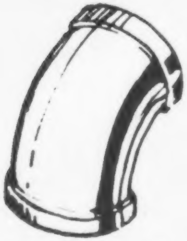

90º Street Elbow

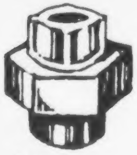

Plug

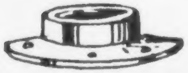

Straight Tee


"Y"


Nipples


45° Elbow

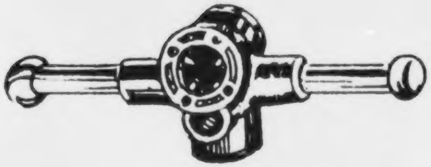

Union


Floor Flange

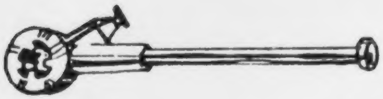
Ag. II - 127-F

TM 1

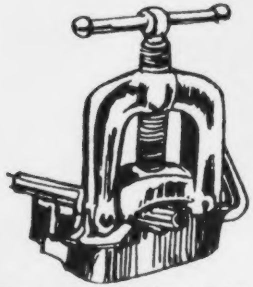
Plumbing Tools



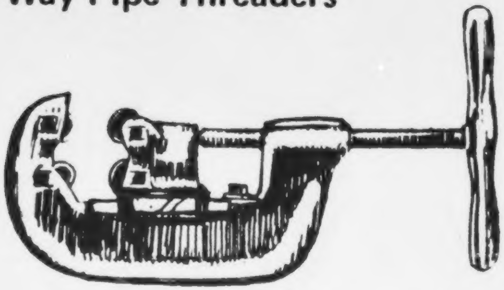
3-Way Pipe Threaders



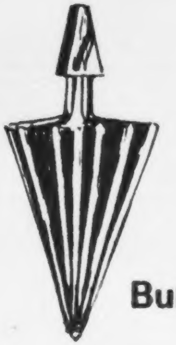
Small Ratchet Threaders



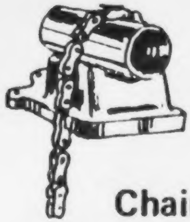
Bench Yoke Vises



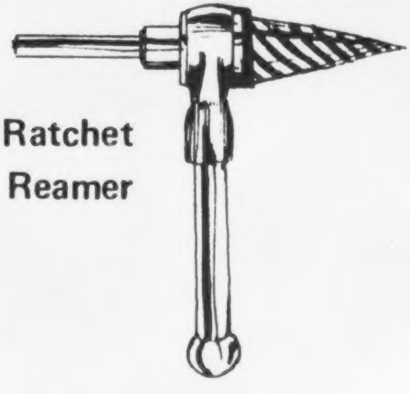
Pipe Cutter



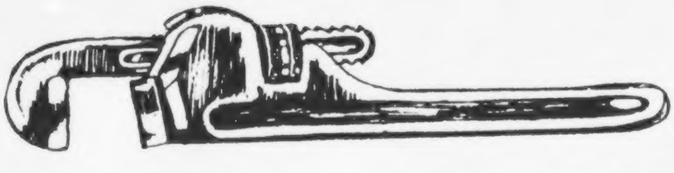
Burr Reamer



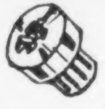
Chain Vises



Spiral Ratchet
Pipe Reamer

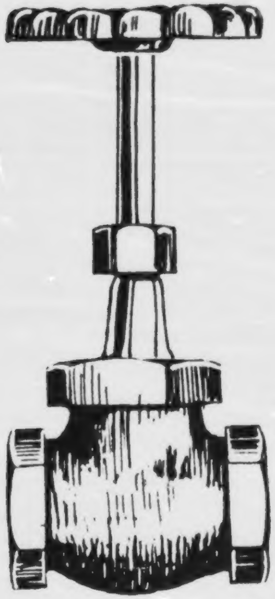


Pipe Wrench

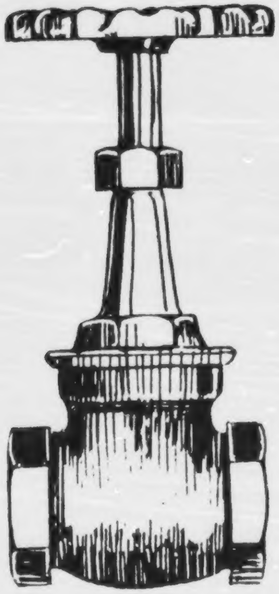


Die

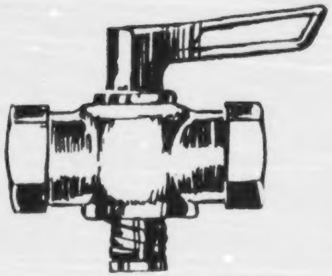
Types of Valves



Globe Valve



Gate Valve

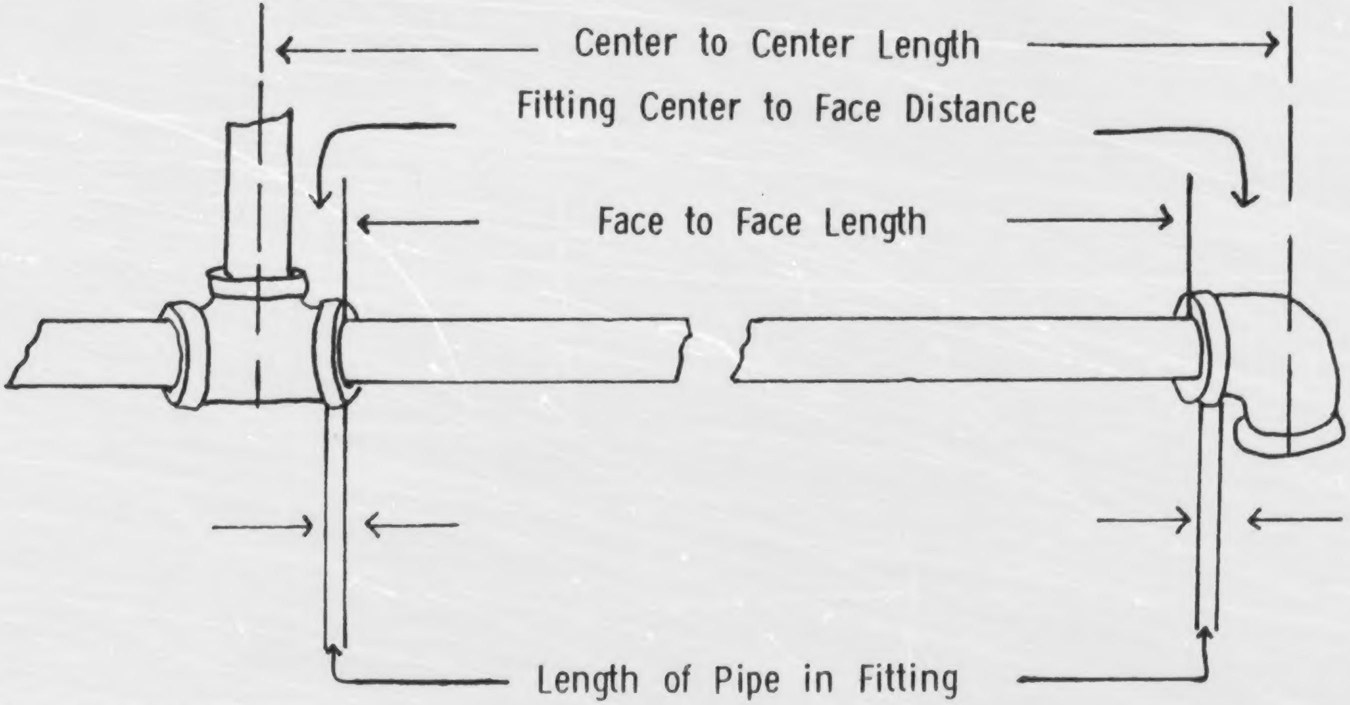


Gas Stop

Ag. II - 131-F

TM 3

MEASURING FOR PIPE LENGTH

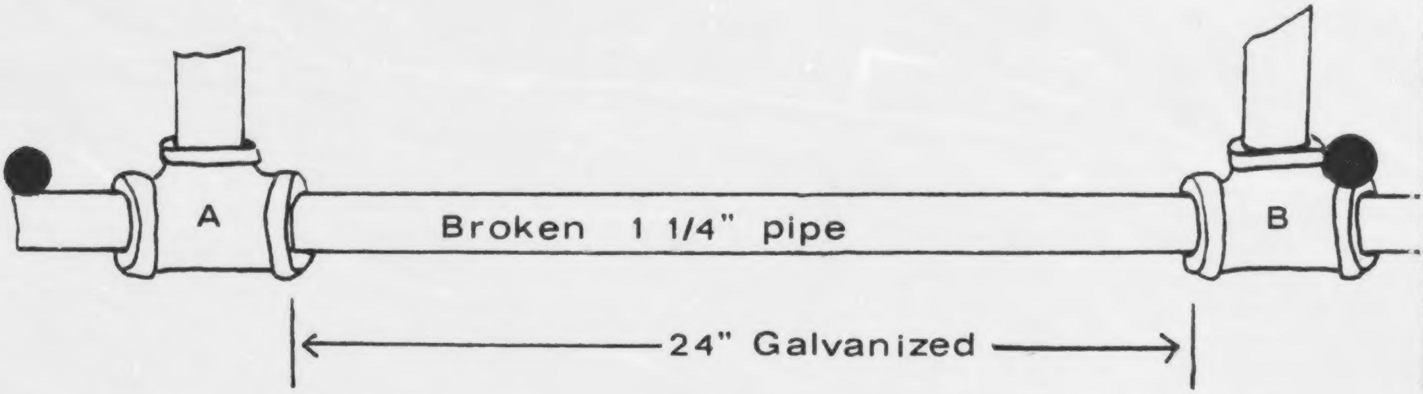

Center to Center Length
Fitting Center to Face Distance
Face to Face Length
Length of Pipe in Fitting

INTRODUCTION TO PLUMBING
UNIT VI

ASSIGNMENT SHEET #1--DETERMINING PIPE AND THREAD LENGTH

Determine the length of the piece of pipe needed in the following situations. Determine the following measurements required for replacing the broken pipe in the figure below.

1. How long a pipe will be needed to replace the broken one in the sketch below? How long a thread is needed?



a. Face to face length = ______________

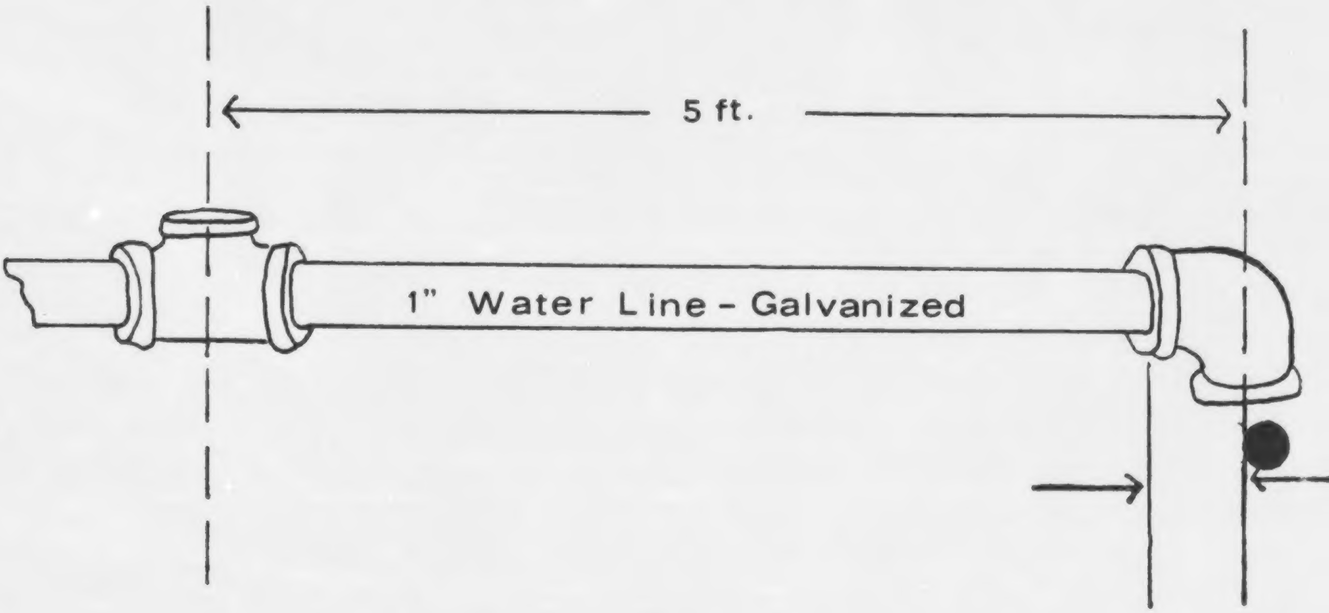
b. Length of inside fittings for A & B = ______________

c. Total length needed = ______________

d. Thread length = ______________

Determine the following measurements required for installing the pipe for a new water supply line shown in the figure below.

2. How long a pipe will be needed to install the new water supply line shown in the sketch below? How long a thread?



a. Center to center distance = ______________

b. Center to face distance - Elbow = ______________

- Straight Tee = ______________

Total = ______________

c. Face to face length = ______________

d. Inside fitting length = ______________

e. Total length needed = ______________

f. Thread length = ______________

INTRODUCTION TO PLUMBING
UNIT VI

JOB SHEET #1--CUTTING PIPE

Demonstrate your ability to cut pipe according to the instructions and procedures given. Cut two pieces of 3/4 inch pipe eight inches long. Cut one piece of 1/2 inch pipe eight inches long. Turn in to the instructor for a grade.

I. Tools needed

- A. Vise
- B. Taper triangular file
- C. Ruler or steel tape
- D. Pipe cutter

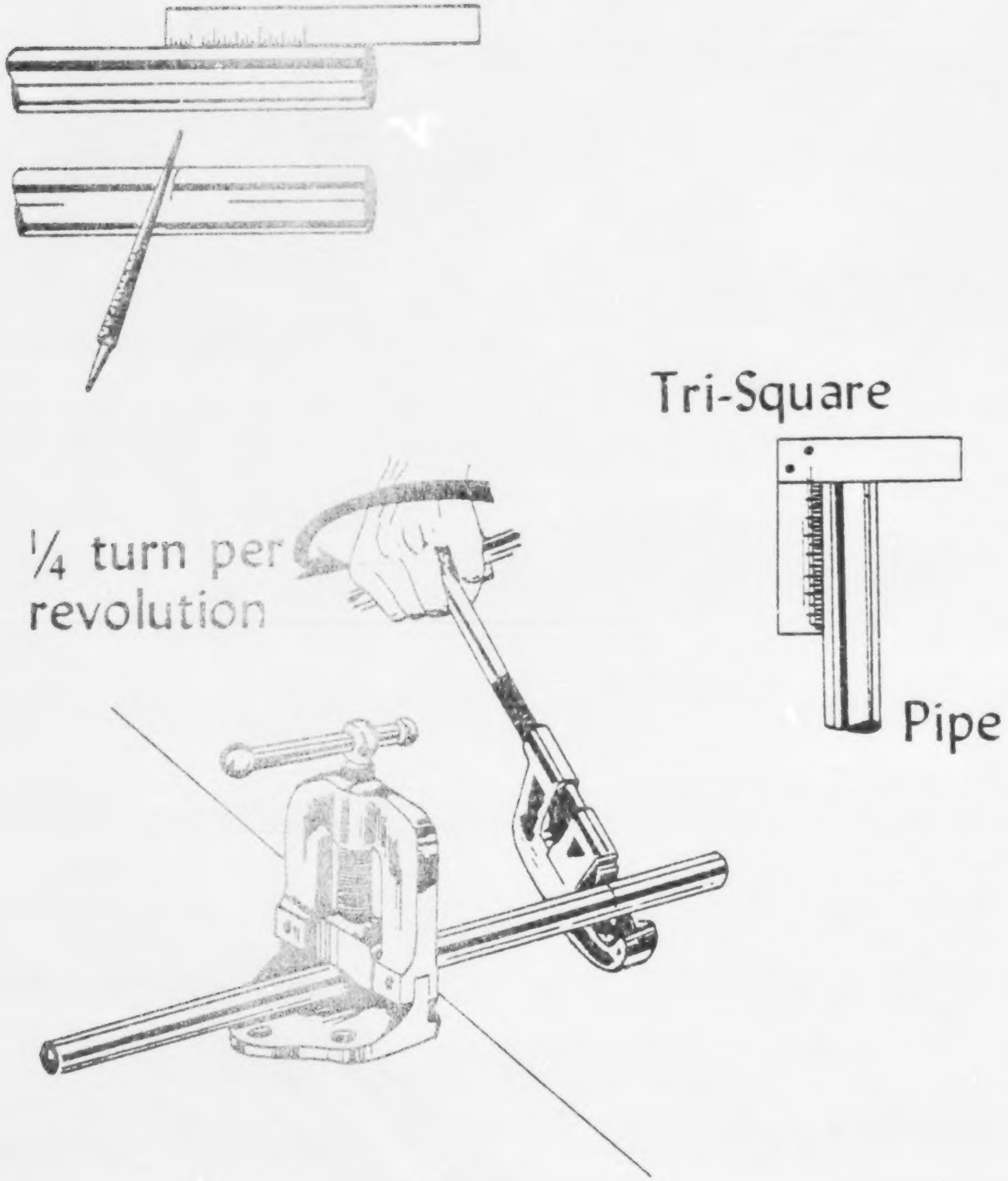
II. Materials needed

- A. Two feet of 3/4 inch pipe
- B. One foot of 1/2 inch pipe

III. Procedures

- A. Measure length of pipe desired
- B. Mark desired length with tapered triangular file
- C. Fasten pipe in vise so mark is at least four inches from vise
- D. Place pipe cutter on mark
- E. Tighten pipe cutter by screwing in handle until cutting wheel is snug against pipe
- F. Hold handle perpendicular to the pipe and tighten handle until cutting wheel penetrates metal
- G. Turn pipe cutter 1/4 turn per revolution until pipe is cut off
- H. Check cut for squareness

IV. Diagram of procedure


Tri-Square
Pipe
¼ turn per revolution

INTRODUCTION TO PLUMBING
UNIT VI

JOB SHEET #2--REAMING PIPE

Demonstrate your ability to ream pipe according to the instructions and procedures given. Ream two pieces of 3/4 inch pipe eight inches long. Ream one piece of 1/2 inch pipe eight inches long. Turn in to the instructor for a grade.

I. Tools needed

   A. Vise

   B. Burr reamer

   C. Carpenter brace

II. Materials needed

   A. Two pieces of 3/4 inch pipe eight inches long

   B. One piece of 1/2 inch pipe eight inches long

III. Procedures

   A. Fasten pipe in vise allowing four inches to extend from vise

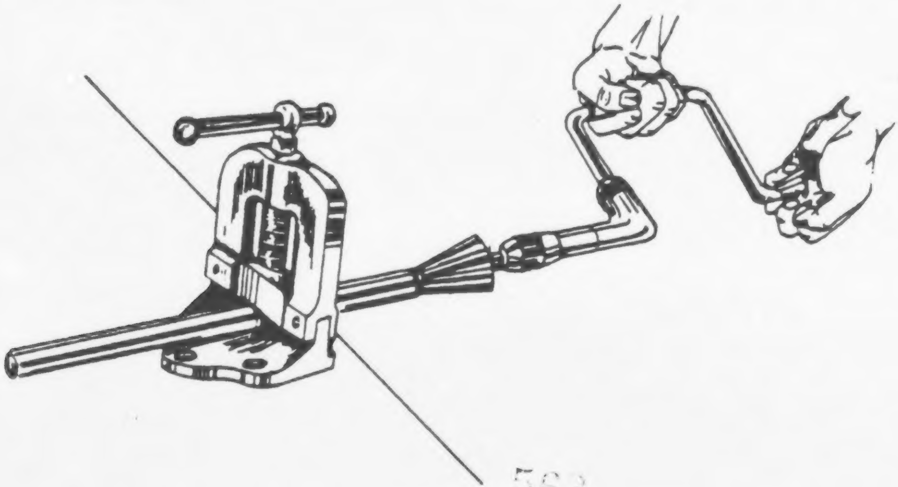
   B. Place reamer in line with pipe

   C. Turn reamer clockwise until inside burr is off

   D. Remove reamer and check with finger to see if burr is cut away

   (NOTE: Do not cut more than necessary as fist threads on pipe will be weakened.)

IV. Diagram of procedure



INTRODUCTION TO PLUMBING
UNIT VI

JOB SHEET #3--THREADING PIPE

Demonstrate your ability to thread pipe according to the instructions and procedures given. Thread the pieces of pipe that were used in job sheets #1 and #2. Thread pipes on both ends and turn in to the instructor for grade.

I. Tools needed

   A. Vise

   B. Flat file

   C. 3/4" and 1/2" dies

   D. Die stock

   E. Cutting oil

   F. Wire brush

II. Materials needed

   A. Two pieces of 3/4 inch pipe eight inches long

   B. One piece of 1/2 inch pipe eight inches long

III. Procedures

   A. Place pipe in vise allowing six inches to extend from vise

   B. File off any outside burr that may be on pipe end caused by cutting pipe

   C. Place proper size die in stock

   D. Place pressure against die holder with palm of hand, turn clockwise until die starts cutting threads

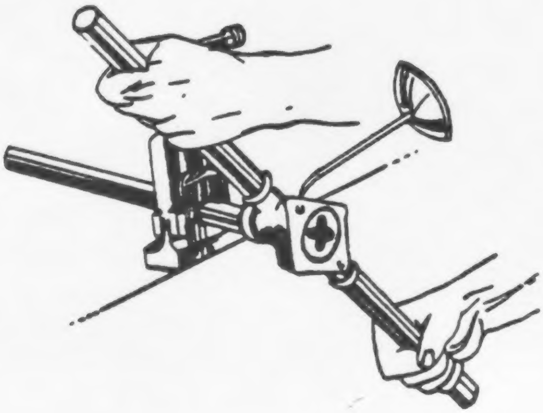
   E. Use cutting oil on the threading area at all times

   F. Continue threading until one thread is past the die

   G. Back off die and inspect threads

   H. Use wire brush and clean thread

IV. Diagram of procedure



INTRODUCTION TO PLUMBING
UNIT VI

TEST

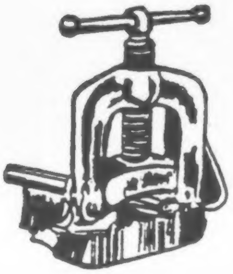
1. Define the following terms:
   a. Trap -
   b. House drain -
   c. Plumbing -
   d. Soil pipes -
   e. Fittings -

2. Name five kinds of pipe and give one use of each.
   a.
   b.
   c.
   d.
   e.

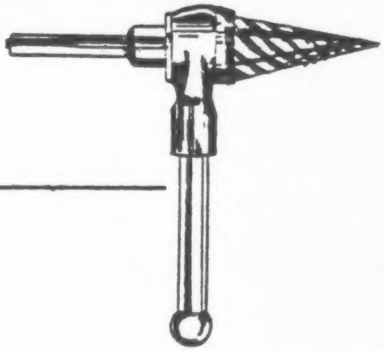
3. Name two reasons for using threading compounds.
   a.
   b.

4. Name four reasons for using cutting oil when threading pipe.
   a.
   b.
   c.
   d.

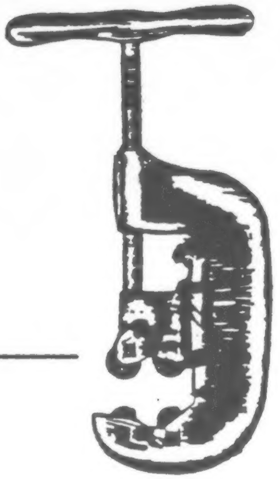
5. Identify the following tools:



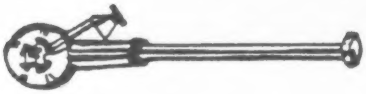
a.________________



b.________________

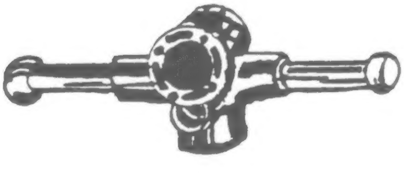


c.________________

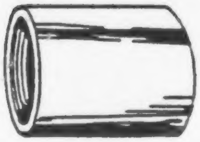


d.________________

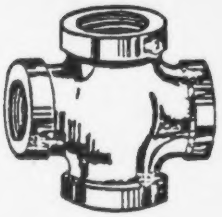
e.________________



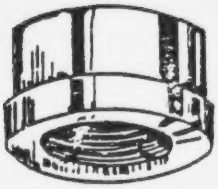
6. Identify the following pipe fittings:



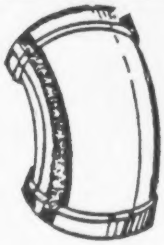
a.________________



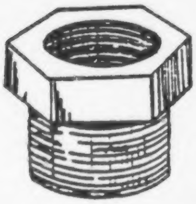
b.________________



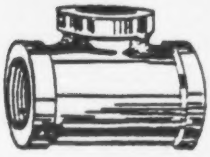
c.________________



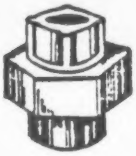
d.________________



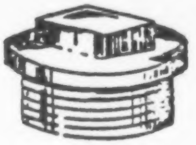
e.________________



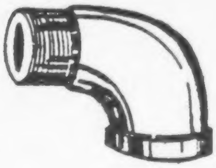
f.________________



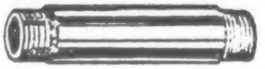
g.________________



h.________________



i.________________



j.________________

7. What are five common sizes of pipe used in plumbing?

   a.

   b.

   c.

   d.

   e.

8. How can you distinguish between bolt and pipe threads?

9. How is bolt size measured?

10. How is pipe size measured?

11. Performance tests will be conducted for the following:

    a. Cutting pipe

    b. Reaming pipe

    c. Threading pipe

CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE
UNIT VII

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to describe the characteristics of a good form. The student should be able to list materials used to make concrete forms. The student should be able to select reinforcing materials for a form concrete construction job. The student should be able to determine the location for the reinforcing materials for the farm concrete construction job.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define two terms associated with concrete forms and reinforcing concrete.
2. State the purpose of concrete forms.
3. List three requirements of good concrete forms.
4. List four of the common materials used in constructing concrete forms.
5. Discuss how to brace forms.
6. Discuss when to remove forms.
7. State the purpose for concrete reinforcement.
8. List two materials used for reinforcing concrete.
9. State five rules for reinforcing concrete.

CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE
UNIT VII

INFORMATION SHEET

I. Terms and definitions

- A. Forms - the materials that are built into the desired shape to hold the concrete, when poured, in place
- B. Reinforcing materials - steel bars or mesh placed in concrete to increase its tensile strength

II. Purpose of Forms

- A. Forms hold the concrete in the shape desired until it sets or hardens enough to stand by itself
- B. Normally, the longer the forms stay on, the stronger the concrete
- C. Forms should be kept in place at least 24 hours on all jobs

III. Requirements of Good Forms

- A. Must be true to size and shape
- B. Should be rigidly braced to prevent bulging, sagging, and spreading
- C. Should be tight and free from openings to prevent leaking
- D. Should be easy to remove after concrete has set

IV. Materials used in Constructing Concrete Forms (TM 1)

- A. Plywood and other manufactured products with a smooth finish

  (NOTE: Crude oil or crankcase oil painted on the inside of the forms will keep the concrete from sticking to the forms when they are removed.)
- B. Dimension lumber for form studs, braces, stakes, and spacers
- C. Wire
- D. Nails

V. Bracing Forms

- A. In addition to joining the forms with nails and wood bracing at strategic points, wire ties through the forms should be tightened against wood spacers
- B. The wood spacers should be removed as the placing of the concrete progresses
- C. Wires must be cut to remove the forms and they may be cut flush with the concrete

VI. Removing Forms

A. In warm weather, forms should remain in place two or three days

(NOTE: When using reuseable forms, covering with plastic and adding water aids curing.)

B. In cold weather, allow forms to remain twice as long

C. In no case, should the forms be removed until the concrete has thoroughly set and there is no danger of damaging

D. Forms left in place for at least a week aid in the curing process by protecting the concrete from drying too rapidly

E. The weather, temperature, and nature of the work determine the length of time to leave the forms in place

F. When reusing forms, clean them as they are removed

VII. Purpose of Concrete Reinforcement

A. Increases the strength of concrete

VIII. Materials Used for Reinforcing Concrete (TM 2)

A. Steel rod

B. Wire mesh

(NOTE: For large jobs, engineers should be consulted for the proper type, size, and spacing of reinforcements.)

IX. Rules for Reinforcing Concrete

A. Use only clean steel (free from rust, paint, and scale)

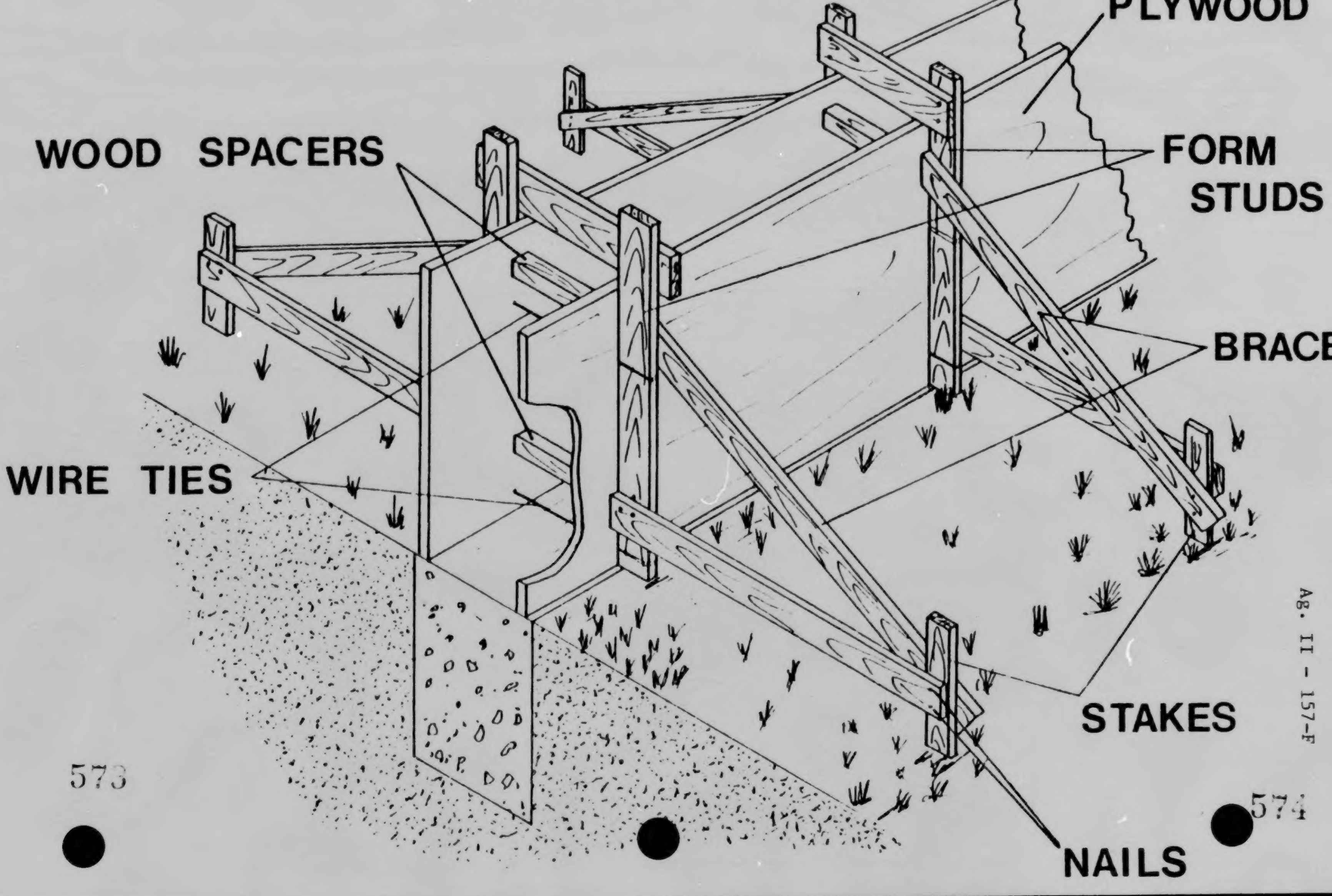
B. Place steel no closer than 3/4 inches from the outside surface

C. Lap all bars 48 times their diameter (1/2 inch bars should be lapped 24 inches and then wired together)

D. Place reinforcement where concrete will be in tension (such as corners, joints, etc.)

E. Position wire mesh or steel near center of depth of slab or sidewalk

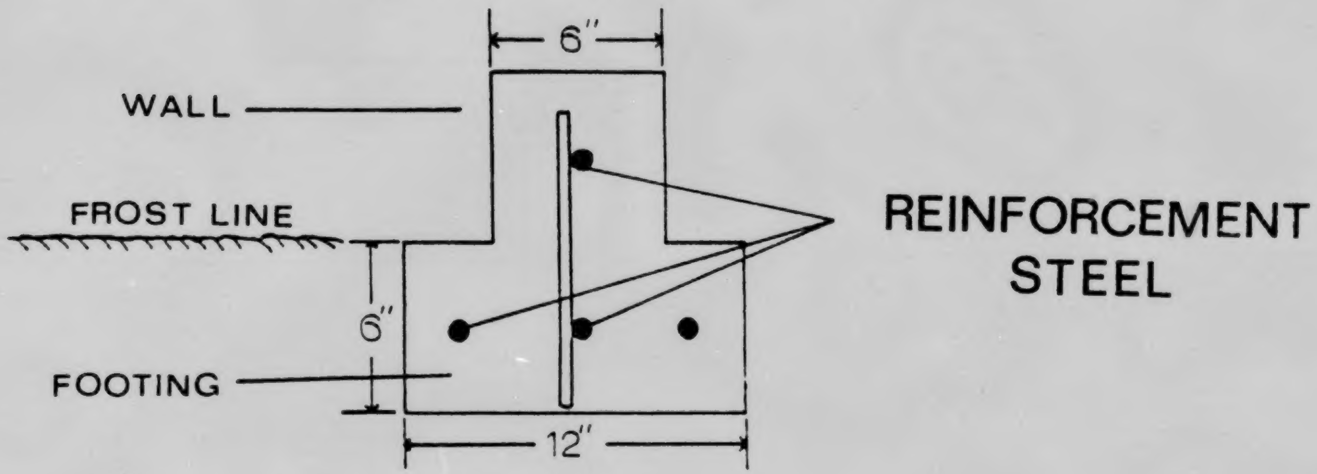
MATERIALS FOR CONSTRUCTING CONCRETE FORMS


PLYWOOD
WOOD SPACERS
FORM STUDS
BRACE
WIRE TIES
STAKES
NAILS

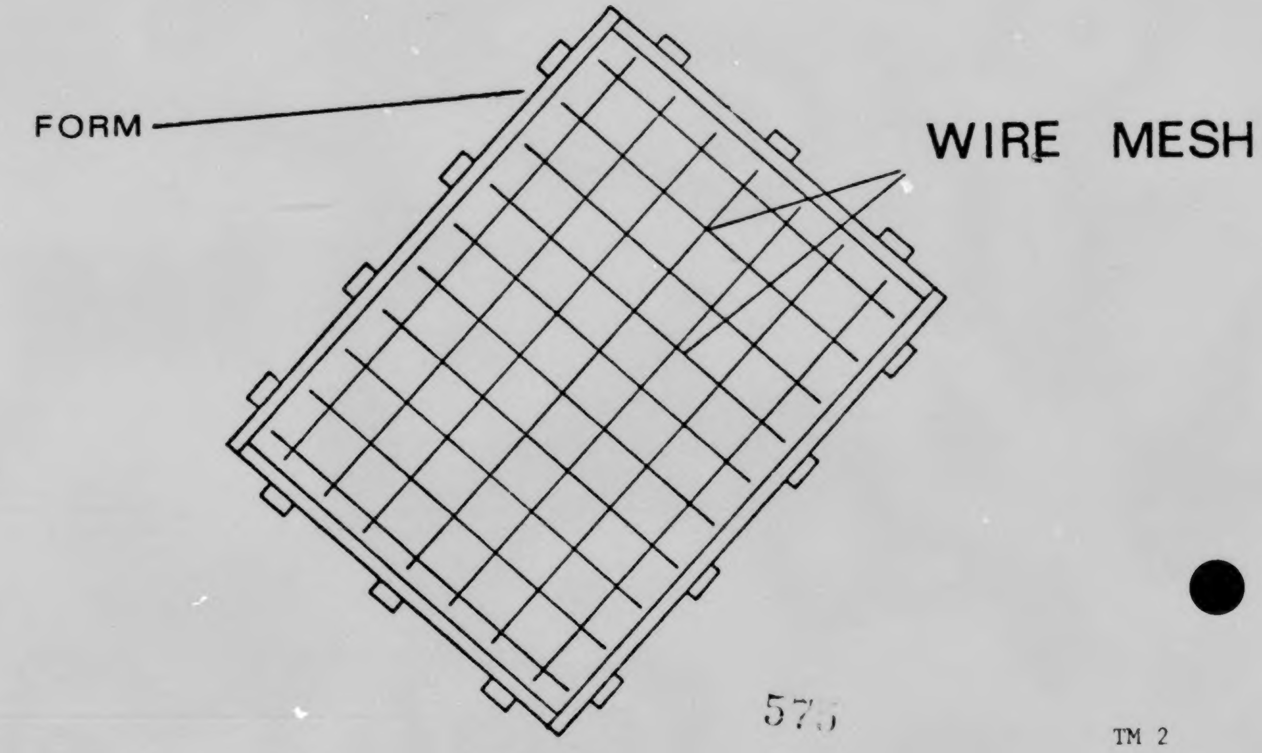
Ag. II - 157-F

MATERIALS FOR REINFORCING CONCRETE

WALL AND FOOTING CROSS – SECTION


6"
WALL
FROST LINE
REINFORCEMENT STEEL
6"
FOOTING
12"

SLAB


FORM
WIRE MESH

CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE
UNIT VII

TEST

1. Define two terms associated with concrete forms and reinforcing concrete.
   a. Forms -
   b. Reinforcing materials -

2. State the purposes of concrete forms.

3. List three requirements of good concrete forms.
   a.
   b.
   c.

4. List four of the common materials used in constructing concrete forms.
   a.
   b.
   c.
   d.

5. Discuss in detail how to brace forms.

6. Discuss when to remove forms.

7. State the purpose for concrete reinforcement.

8. List two materials used for reinforcing concrete.

   a.

   b.

9. State five rules for reinforcing concrete.

   a.

   b.

   c.

   d.

   e.

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to describe portland cement characteristics and types, and select materials for quality concrete. The student should be able to determine amounts of material to use and proper mixing. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After the completion of this unit, the student should be able to:

1. Match terms associated with concrete when definitions are given.
2. List six uses of concrete in agriculture.
3. List five advantages of concrete construction.
4. Match portland cement types with characteristics of each.
5. List the ingredients used in concrete.
6. Write the approximate volume of cement, water, and aggregate in concrete.
7. Describe the makeup of a 1:2:3 concrete mixture.
8. Identify from a list the primary factor in concrete strength.
9. Complete a table on determining the moisture in sand.
10. Describe how consistency of concrete should be altered.
11. State Fullers rule as it applies to amount of materials needed in concrete.
12. List in order the steps in machine and hand mixing.
13. List three advantages and three disadvantages of ready-mixed concrete.
14. Describe how to properly prepare for an order ready-mix.
15. Determine the amount of concrete needed for a given job.
16. Make a trail mix of concrete.

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

INFORMATION SHEET

I. Terms and definitions

   A. Concrete - a mixture of a paste of portland cement and water, binding fine and coarse aggregates, into a rock-like mass as the paste hardens through chemical reaction

   B. Cement - manufactured product of lime, iron oxide, silica, and alumina

   C. Sand - (fine aggregate) particles that range from very fine to 1/4 inch in diameter

   D. Gravel - (coarse aggregate) particles range from 1/4 to 1 1/2 inches

   E. Fullers rule - states that the mixing of a total of 42 volumes of cement, sand, and gravel will produce 27 volumes of concrete

   F. Water-Cement ratio - the ratio of water to cement usually expressed in gallons per bag of cement

II. Agriculture Uses of Concrete

   A. Fence posts

   B. Water troughs

   C. Walks

   D. Driveways

   E. Floors

   F. Feeding troughs

   G. Walls and foundations

   H. Septic tanks

   I. Culverts

   J. Feeding floors

   K. Manure pits

   L. Silos

   M. Steps

   N. Setting posts

   O. Cattle guards

III. Advantages of Concrete

   A. Fire proof

   B. Durable and permanent

   C. Water tight

D. Economical

E. Termite and rodent proof

F. Low maintenance

G. Storm resistant

H. Readily adapted

IV. Types and Uses of Portland Cement

A. Type I - normal portland; sidewalks, floors and bridges

B. Type II - modified portland; lower heat of hydration; heavy, thick work

C. Type III - high, early, strength; used when high strengths are desired at very early periods (1-3 days); using during low temperatures

D. Type IV - low heat; used only in large masses; dams, etc.

E. Type V - sulfate resistant; resists severe sulfate and alkali action

V. Ingredients Used in Concrete

A. Cement

B. Sand (fine aggregate)

D. Water - should be of drinking water quality, free of oil and impurities (NOTE: sand and gravel are filler material to make concrete economical. They should be hard, rounded and clean.)

VI. Proportion of Materials in Concrete (Transparency 1)

Approximate volume of materials in concrete
Cement - 10%
Water - 15%
Sand and Gravel - 75%

VII. Determining what a 1:2:3 Mixture of Concrete is

A. First digit equals parts of cement

B. Second digit equals parts of sand

C. Third digit equals parts of gravel

VIII. Determining the Strength of Concrete

A. Primarily determined by the amount of water added for each sack of cement (water-cement ratio)

(NOTE: the proper amounts of water and cement should be established first and not altered. Aggregates should be altered to get a workable mixture)

B. The amount of water in the sand must be considered when measuring the amount of water in the mixture (example: a five gallon mix should contain only five gallons water including the water in the sand)

(NOTE: Recommended mixtures:

1. 5 gallon mix - for acid or alkaline resistant work or thin work
2. 6 gallon mix - water tight and reinforced concrete
3. 7 gallon mix - foundation walls and retaining walls)

IX. Measuring Moisture in Sand (Transparency 2)

- A. Hard press method (press sample into a ball)
- B. Damp sand (1/4 gallon water per cubic foot) ball of sand falls apart when hand is opened
- C. Wet sand - (1/2 gallon water per cubic foot) ball of sand holds its shape when hand is opened
- D. Very wet sand - (3/4 gallon water per cubic foot) ball formed, leaves hand wet

X. Consistency of Mixture

- A. Controlled by addition or subtraction of aggregate
- B. Consistency established by trial batches

XI. Determining Amount of Materials Needed in Concrete (Transparency 3)

- A. Volume of raw material does not equal finished volume (the smaller particles fill in spaces between larger particles)
- B. Fullers rule - mixing of a total of 42 volumes of cement, sand, and gravel produces 27 volumes of concrete

XII. Mixing Concrete

- A. Machine mixing
  1. Determine mixer capacity
  2. Establish water-cement ratio for job (correct for sand moisture)
  3. Place measured amount of water in mixer
  4. Add part of gravel
  5. Add measured amount of cement
  6. Add sand and gravel to obtain proper consistency
  7. Mix for 2-3 minutes
- B. Hand mixing
  1. Establish water-cement ratio
  2. Place sand in mixing container
  3. Add cement and mix well with sand
  4. Add gravel and mix
  5. Add water and mix
  6. Add sand and/or gravel for proper consistency

III. Ready-mixed Concrete

- A. Advantages
    - 1. Convenient
    - 2. Less hired labor needed
    - 3. Quicker
    - 4. In some cases more economical
    - 5. Assured of good quality
- B. Disadvantages
    - 1. Cost may be high (mileage)
    - 2. Forms must be stronger
    - 3. Not always available when wanted
    - 4. Sometimes large areas ready to finish at same time

XIV. Preparing and Ordering Ready-mix

- A. Determine water-cement ratio required for job
- B. Determine bags of cement per cubic yard of concrete (range: from 5-7 bags)
- C. Determine amount of concrete needed
- D. Determine type of mix (1:2:3)
- E. Call early and give (A-D) information and:
    - 1. Time you want delivery
    - 2. Specific direction on job site
- F. Reconfirm your order early on day of delivery
- G. Prepare site:
    - 1. Wet forms and subgrade 4-6 hours ahead of pouring concrete (keeps water in concrete)
    - 2. Have forms well braced
    - 3. Have equipment ready

XV. Determining the Quality of Concrete Needed

- A. Determine the surface area (length x width)
- B. Determine average depth of concrete
- C. Determine cubic feet $\frac{(\text{length in feet x width in feet x thickness in inches})}{12}$
- D. Determine cubic yards (27 cubic feet in 1 cubic yard) = $\frac{\text{cubic feet}}{27}$

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

ASSIGNMENT SHEET #1 - APPLYING FULLER RULE

Using a 6 gallon mix (1-2 1/4-3), how many sacks of cement and cubic yards of sand and gravel will be needed to build a sidewalk 4" thick, 6 feet wide, and 100 feet long.

A. Determine cubic feet of concrete

$$\frac{\text{Length x width x depth}}{12}$$ ______________________________ cubic feet

B. Determine cubic feet of raw materials

$$\frac{\text{Cubic feet concrete x 42}}{27}$$ ______________________________ cubic feet

C. Determine total volumes of mix

1 + 2 1/4 + 3 = ______________________________

D. Determine sacks of cement

$$\frac{\text{Cubic feet of raw materials}}{\text{Total volumes of mix}} =$$ ______________________________ sacks

E. Determine the cubic yards of sand

$$\frac{\text{Sacks of cement (sack contains 1 cubic foot) x sand proportion of mix (2.25)}}{27} =$$

______________________________ cubic yards

F. Determine the cubic yards of gravel

$$\frac{\text{Sacks of cement x gravel proportion (3)}}{27} =$$ ____________________ cubic yards

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

ASSIGNMENT SHEET #2 - DETERMINING CUBIC FEET OF CONCRETE FOR A SLAB 200 x 20 x 4" DEEP

A. Determine surface area - Length ____________, width ____________

B. Determine average depth ______________.

C. Determine cubic feet

$$\frac{\text{Length x width x thickness}}{12} = \underline{\hspace{6cm}}$$

D. Determine cubic yard

$$\frac{\text{Cubic feet}}{27} = \underline{\hspace{6cm}}$$

(NOTE: 27 cubic feet = 1 cubic yard)

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

TEST

1. Match the following concrete terms with the definition

_____a. Concrete

_____b. Cement

_____c. Sand

_____d. Gravel

_____e. Fullers Rule

_____f. Water-Cement Ratio

1. Ratio of water to cement
2. Manufactured product of lime, iron oxide, silica, and alumina.
3. Aggregates ranging from 1/4" to 1 1/2" in size
4. Aggregates ranging from very fine to 1/4" in diameter
5. Mixing a total of 42 volumes of cement, sand and gravel will produce 27 volumes of concrete.
6. Mixture of a paste of cement and water, binding fine and coarse aggregate into a rock-like mass.

2. List six uses of concrete in agriculture.

A.______________________________ D.______________________________

B.______________________________ E.______________________________

C.______________________________ F.______________________________

3. List five advantages of concrete construction.

a.

b.

c.

d.

e.

4. Match the portland cement types with the correct characteristic.

_____a. Type I Portland

_____b. Type II Portland

_____c. Type III Portland

_____d. Type IV Portland

_____e. Type V Portland

1. Normal portland
2. Modified portland - lower hydration heat
3. Sulfate resistant type
4. Used in massive structures, dams, etc.
5. High early strength type

5. List the four ingredients of concrete.

   a.

   b.

   c.

   d.

6. Write the approximate volume each of the following constitute of a concrete batch.

   Cement ____________%

   Water ____________%

   Sand and gravel ____________%

7. Describe (by volume) what a 1:2:3 mixture would be.

   a.

   b.

   c.

8. Identify from the following list what primarily determines the strength of concrete by circling appropriate letter.

   a. Water cement ratio.

   b. Breaking strength of aggregate.

   c. Amount of rock added.

9. Complete the following table on moisture in sand.

   a. ______________sand - ball holds shape 1/2 gallon per cubic foot

   b. ______________sand - ball falls apart 1/4 gallon per cubic foot

   c. ______________sand - sparkles, wets hand 3/4 gallon per cubic foot

   (1) Dry (2) Wet (3) Damp (4) Very wet

10. Describe how the consistency of concrete should be altered.

11. State Fullers rule as it applies to concrete.

12. Place in order the steps of hand mixing and machine mixing. (Place 1 for first, 2 for second, etc.)

Hand Mixing

a. ______Add gravel and mix.

b. ______Add cement and mix with sand.

c. ______Establish water-cement ratio.

d. ______Place sand in mixing container.

e. ______Add water and mix.

f. ______Add sand and gravel for proper consistency.

Machine Mixing

a.______Add sand and gravel for consistency.

b.______Determine mixer capacity.

c.______Mix 2-3 minutes.

d.______Add part of gravel.

e.______Establish water-cement ratio

f.______Place measures amount o[illegible] water in mixer

g.______Add measured amount of cement

13. List three advantages and three disadvantages of ready-mixed concrete.

Advantages	Disadvantages
a.	a.
b.	b.
c.	c.

14. Describe how to prepare for, and order ready-mix concrete.

Preparing for	Ordering
a.	a.
b.	b.
c.	c.
	d.
	e.
	f.

PLACING, FINISHING, AND CURING CONCRETE
UNIT IX

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to match a list of terms with the definitions dealing with placing, finishing, and curing concrete. The student should be able to name the procedures involved in placing concrete. The student should be able to list the steps used in finishing concrete. The student should be able to describe the various types of finishes, their uses, and how they are obtained. The student should be able to name the processes used in properly curing concrete. This knowledge will be evidenced by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms dealing with placing, finishing and curing concrete with the proper definitions.
2. Name five procedures used in properly placing concrete.
3. Name five procedures that are used in finishing concrete.
4. Name on a written examination the various types of concrete finishes, their uses, and how they are obtained.
5. Name two procedures used in properly curing concrete.
6. Name the three factors which proper concrete curing improves.
7. List two common methods of curing concrete.

PLACING, FINISHING, AND CURING CONCRETE
UNIT IX

INFORMATION SHEET

I. Terms and definitions

A. Screeding - removing the excessive concrete from the form

B. Edging - rounding the edges to prevent chipping or damage to the edge of the concrete

C. Floating - pushing the larger aggregates down away from the surface and brings mortar to the surface

D. Curing - plenty of moisture is present to obtain maximum hydration of the cement

E. Scaling - when surface breaks away from the slab

F. Crazing - fine hair cracks on surface of concrete

G. Dusting - powdery material on surface of concrete

H. Jointer - to create a groove across concrete to control cracking

II. Placing Procedures

A. Place concrete in forms as soon as possible after making. It will begin to set within 30 to 45 minutes

B. Place concrete where it is needed. Do not drag or allow it to flow

C. Place in even layers about 6 to 8 inches deep and tamp well.

D. Avoid dumping concrete against side of forms

E. Avoid letting the chute or buggy hit the side of the forms

F. Tamp and spade the concrete mixture thoroughly to prevent air pockets

G. Work the mixture against the side of the forms so the large aggregates will be forced away from the forms for a smooth surface. This is called puddling.

H. In all cases, procedures should be carried out to prevent water from collecting at the ends and corners of the forms.

III. Finishing Concrete (Transparencies 1 and 2)

A. Concrete should be screeded as soon as it has been tamped or spaded in the forms

B. Finishing should be delayed until the surface is quite stiff but still workable

C. Surface water should be allowed to evaporate

D. Dry cement should not be sprinkled on top to remove moisture for finishing purposes, as this material will form a layer that is likely to develop hair line cracks.

E. Edging and jointing follow the screeding operation

F. After the concrete is edged and jointed, it should be floated

G. Trowel the concrete to bring a thick film of cement to the top, which results in a smooth level finish

IV. Types of Concrete Finishes (Transparency 3)

Type	Use	Obtained By
A. Gritty, non-slipping	Walks, dairy barn floors	Using wood float
B. Coarse, scored surface	Driveways, lots, ramps, floors	Using a stiff broom
C. Smooth troweled finish	Table tops, feed troughs	Using steel trowel
D. Pea grain	Porches and patios	Washing with water hose

V. Curing Concrete

A. Curing should be started as early as possible and continued for at least seven days.

B. Moisture curing greatly increases the strength of the concrete.

VI. Factors Improved by Proper Concrete Curing

A. Strength

B. Durability

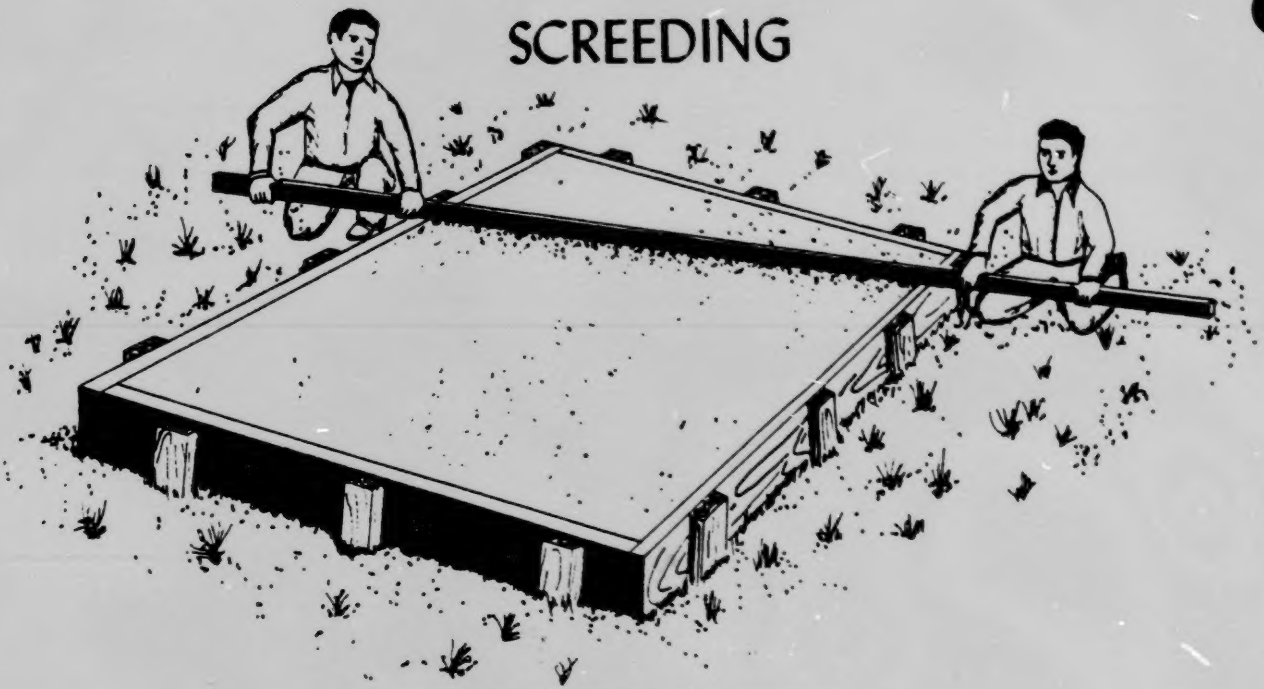
C. Watertightness

VII. The Common Methods of Curing Concrete

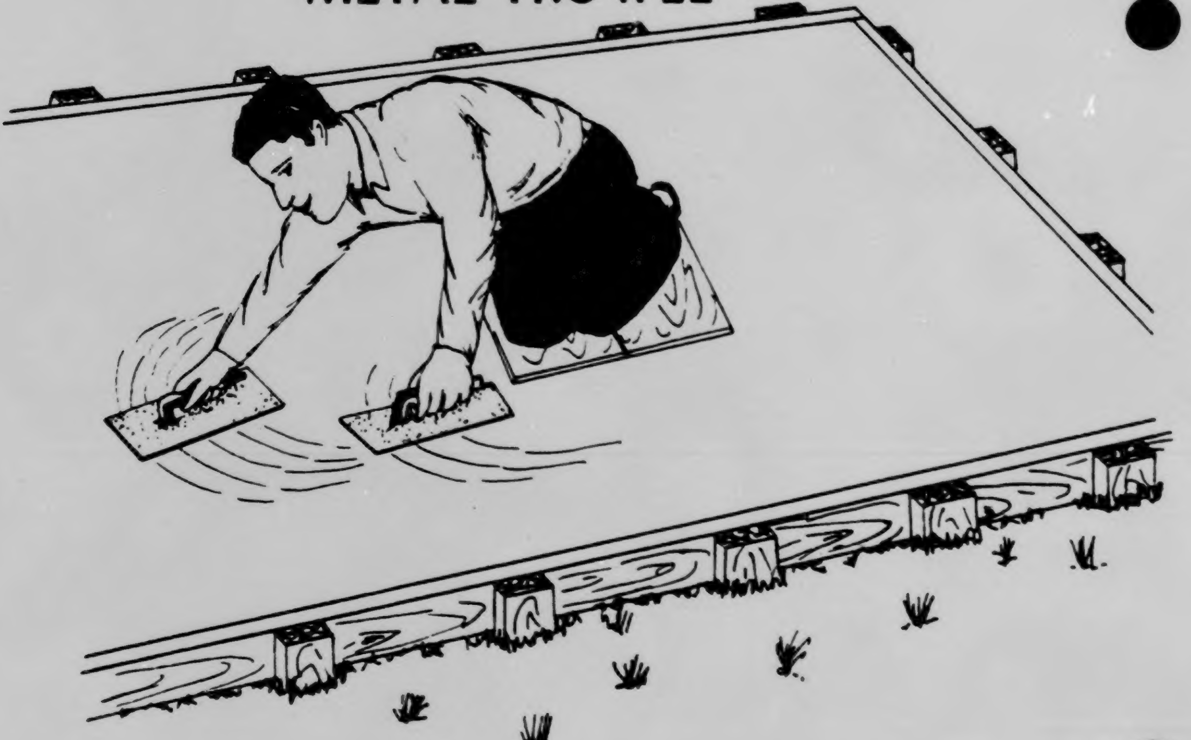
A. Cover with straw, sand, wet burlap, or canvas as soon as possible without marring surface. Keep this covering constantly wet during the curing process.

B. Flood the surface and hold the water on the surface with some type of border around the edge of slab.

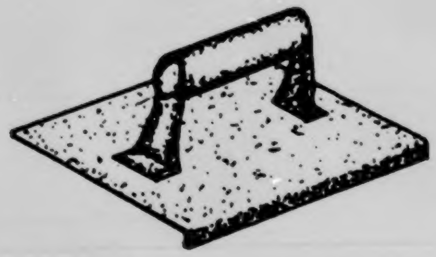
SCREEDING

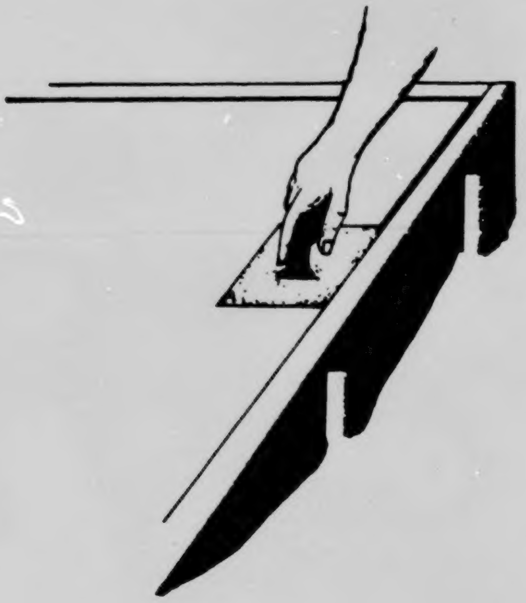


METAL TROWEL

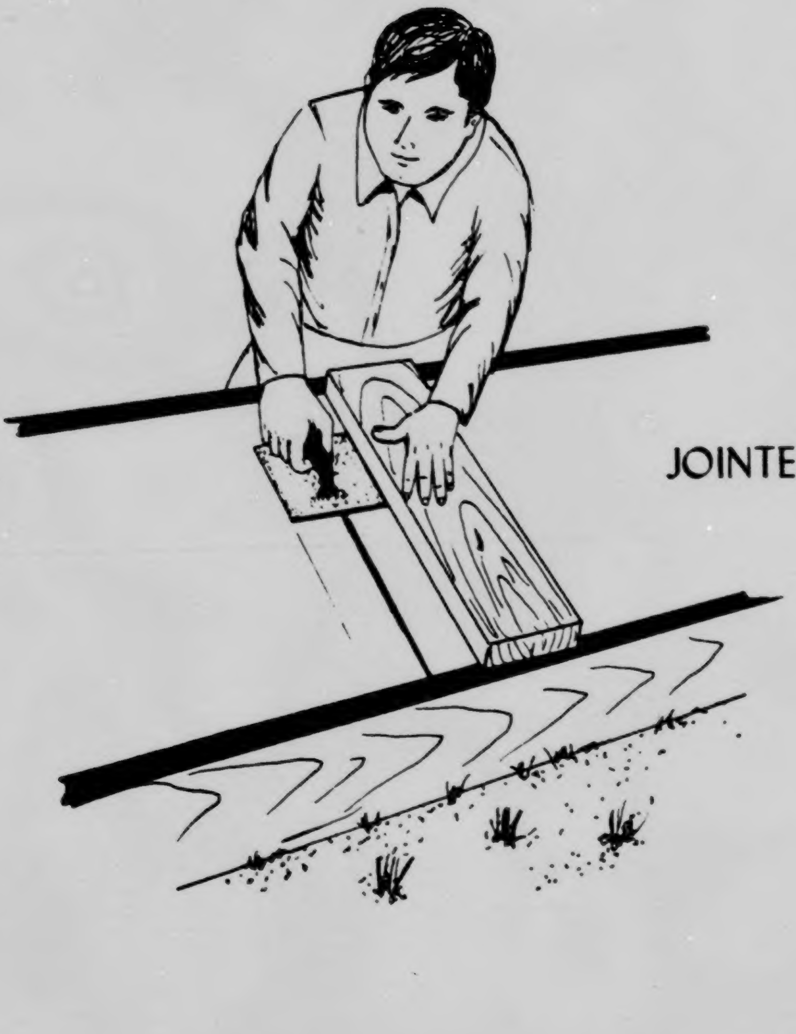


EDGING AND JOINTING

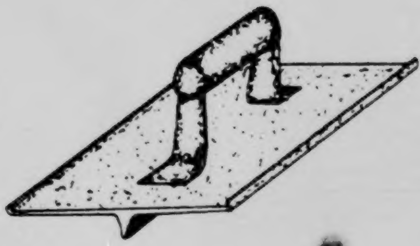




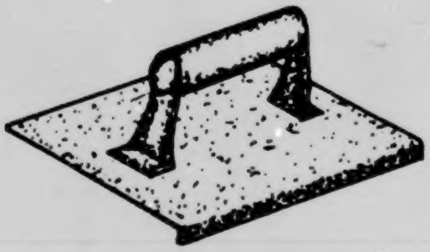
EDGER

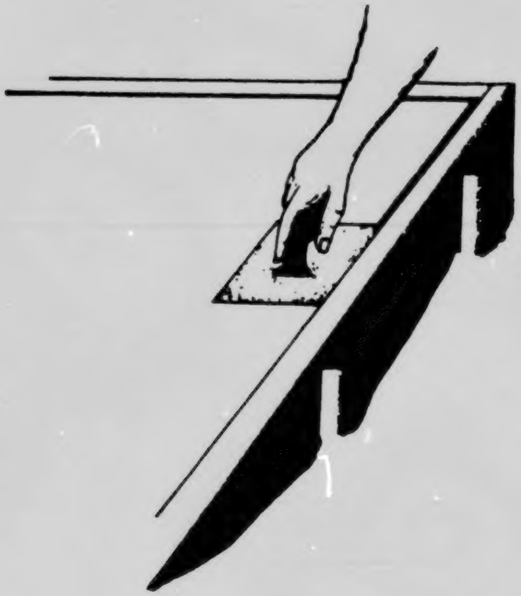


JOINTER

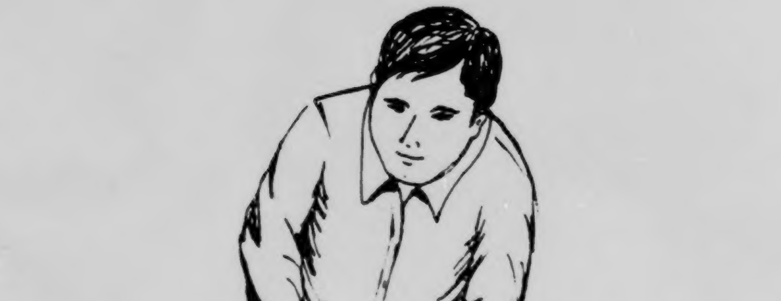


EDGING AND JOINTING

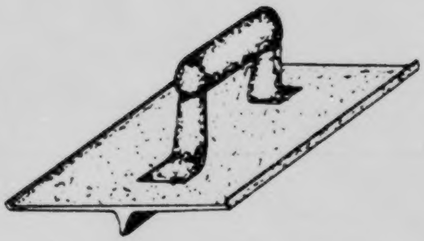




EDGER



JOINTER



TYPES OF FINISH

SURFACE	USE	OBTAINED BY
Gritty, non-slipping	Walks, dairy barn floors, etc.	Using wood float
Coarse, scored	Driveways, feeding floors, ramps	Using stiff broom
Smooth finish	Table tops, feed troughs	Using steel trowel
Pea grain	Porches, walks, patios	Washing with water hose

PLACING, FINISHING, AND CURING CONCRETE
UNIT IX

TEST

1. Match the terms with the proper definitions.

_____a. Crazing
_____b. Curing
_____c. Edging
_____d. Screeding
_____e. Floating
_____f. Dusting
_____g. Scaling
_____h. Jointer

1. Remove the excessive concrete from the forms
2. Rounding the edges to prevent chipping or damage to the edge of the concrete
3. Pushing the larger aggregates down away from the surface and brings mortar to the surface
4. Plenty of moisture is present to obtain maximum hydration of the cement
5. When surface breaks away from the slab
6. Fine hair cracks on surface of concrete
7. Powdery material on surface of concrete
8. To create a groove across concrete to control cracking.

2. Name five of the procedures used in properly placing concrete.

a.
b.
c.
d.
e.

3. Name five procedures that are used in finishing concrete.

a.
b.
c.
d.
e.

4. Name the four types of concrete finishes, their uses, and how they are obtained.

	Types	Uses	Obtained by
a.			
b.			
c.			
d.			

5. Name two methods used in properly curing concrete.

   a.

   b.

6. Name the three factors which proper concrete curing improves.

   a.

   b.

   c.

7. List two common methods of curing concrete.

   a.

   b.

AGRICULTURAL CHEMICALS
UNIT I

SUGGESTED ACTIVITIES

I. Instructor

- A. Provide students with objective sheet.
- B. Provide each student with information sheets.
- C. Make transparencies.
- D. Acquire Agricultural Chemicals Safety Instructor book and student book from Vocational Education Publications, California State Polytechnic College, San Luis Obispo, CA 93401
- E. Discuss terminal and specific objectives with students.
- F. Discuss information.
- G. Field trip to chemical sprayer.
- H. Give test.

II. Student

- A. Read objectives.
- B. Study information sheets.
- C. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Supplemental information sheets #1, #2, and #3
- D. Transparency masters
  - TM 1 - Agricultural Chemicals
  - TM 2 - Oral LD_{50} Values
  - TM 3 - Sample Chemical Label
  - TM 4 - Key Words on Labels
  - TM 5 - Safety Precaution Before Chemical Use
  - TM 6 - Proper Spray Clothing
  - TM 7 - Disposal of Empty Containers
  - TM 8 - Certification Card For Commercial Applicators
  - TM 9 - Categories of Commercial Applicators

E. Assignment Sheet #1 - Emergency First Aid

F. Test

G. Answers to test

II. References:

A. "Handling and Using Agricultural Chemicals Safely", Vocational Agriculture Service, University of Illinois, Urbana Illinois.

B. Pesticide Safety Depends on You, XC-512, Cooperative Extension Service, Kansas State University, Manhattan, Kansas 66506.

C. Agriculture Chemicals Safety, Instructors and students books, Vocational Education Publications, California State Polytechnic College, San Luis Obispo, CA 93401.

D. "Be Safe When You Use Insecticides, Grain Fungicides, Rodenticides, Feed Additives, Seed Treatments," XMF-221, Extension Service, Kansas State University, Manhattan, Kansas 66506.

E. "Chemical Task Force Reports," Free Monthly Publications, Cooperative Extension Services, Kansas State University, Manhattan, Kansas 66506.

F. Kansas Pesticide Law and Regulations, Kansas State Board of Agriculture, Topeka, Kansas 66612, 1978.

G. Farrington, William S., Paul R. Vaughn, Clyde F. Sartor, and Ronald A. Brown. Fertilizer, Chemicals, and Seed., McGraw Hill, Inc., c. 1978.

AGRICULTURAL CHEMICALS
UNIT I

ANSWERS TO TEST

1. a. Pesticide - A substance or mixture used for destroying or repelling such pests as insects, rodents, nematodes, weeds, and brush.
   b. Defoliant - Any substance or mixture of substances used to cause leaves or foliage to drop from plants, generally to facilitate harvesting.
   c. Antibiotics - Any chemical or chemicals produced by living organisms that help alleviate or control bacterial diseases.
   d. Poison - A substance which, if introduced into an organism in relatively small amounts, may chemically produce an injurious or deadly effect.
   e. Toxicity - The degree a given substance injures plants or animals.
   f. LD_{50} - The average lethal dosage of the poisonous substance required to kill 50% of a large population of laboratory animals.
   g. Acute exposure - Refers to inhaling or absorbing of large amounts of chemicals in a short period of time.
   h. Hazard - The danger or probability that injury will result from the use of a substance in a given quantity and manner.
   i. Safety - The practical certainty that injury will not result from the use of a given substance.
   j. Insecticide - A chemical substance used to kill or repel insects such as flies and grasshoppers.

2. a. Chemical labels
   b. Technical publications from chemical firms
   c. State and federal laws and regulations

3. Any five of the following:
   a. Poison - skull, crossbones
   b. Danger
   c. Caution or warning
   d. Name and address of manufacturer
   e. Statement of net content
   f. Ingredients
   g. Direction of use
   h. Precautionary statements

i. Date of expiration

j. Antidote

4. a. Research

   b. Development

   c. Dissemination of information

5. a. Increase production

   b. Reduce pest loss

   c. Control undesirable vegetation

6. a. Pest may become more established following chemical use due to loss of predators and parasites.

   b. Non-target organisms may be adversely affected.

   c. Human poisoning may occur.

7. a. Weeds

   b. Insects

   c. Disease

   d. Rodents

   e. Nematodes

8. Any six of the following:

   a. Reduced vigor of plants and animals

   b. Decreased yields from crops

   c. Decreased production from livestock

   d. Lowered quality of crop and livestock products

   e. Losses occuring in storage

   f. Reduced profits and increased productions costs

   g. Damage to buildings and equipment

   h. Reduced land values

9. A repellent serves as a preventative measure and a contact poison will cause death.

10. Any three of the following:
    a. Absorption through skin
    b. Swallowing
    c. Absorption by breathing
    d. Absorption through eyes

11. Any five of the following:
    a. Safety goggles
    b. Rubber gloves
    c. Rubber boots
    d. Long sleeved shirt
    e. Cap
    f. Respirators
    g. Rubber apron
    h. Slicker suit

12. Any three of the following:
    a. Read label before using
    b. Use only when necessary
    c. Use according to recommendations
    d. Avoid spray and dust drift
    e. Keep away from livestock
    f. Cover feed and water containers when using

13. a. Wear appropriate protective clothing and accessories
    b. Minimize drift by adjusting sprayer equipment
    c. Avoid residue build-up

14. Any three of the following:
    a. Properly dispose of unwanted chemicals
    b. Properly dispose of unwanted chemical containers
    c. Clean the spraying equipment and area
    d. Remove protective clothing and clean up

15. a. Burning
    b. Burying

16. Any three of the following:
    a. Store in original containers
    b. Store away from children
    c. Store away from feed
    d. Store in cool, dry area
    e. Store in locked cabinet

17. Discussion should include the following points:
    a. Obtain official approval to apply and/or supply agricultural chemicals
    b. Recognize the responsibilities involved by those recommending and supplying chemicals
    c. Complete and file applicator's records
    d. Complete and file operator's records

FUTURE FARMERS OF AMERICA
UNIT I

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide students with objective sheet

   B. Provide students with information sheet

   C. Make transparencies

   D. Discuss terminal and specific objectives

   E. Discuss information sheets

   F. Evaluate the student's attitudes concerning the Code of Ethics and the proper wear to the FFA jacket

   G. Give test

II. Student

   A. Read objectives

   B. Study information sheet

   C. Demonstrate the proper attitude concerning the Code of Ethics of the FFA and the proper wear of the FFA jacket

   D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objective sheet

   B. Information sheet

   C. Transparency masters

      TM 1 - Symbols of FFA Officers' Stations
      TM 2 - Room Arrangement for FFA Meeting

   D. Test

   E. Answers to test

II. References:

   A. Official Manual, Future Farmers of America, Alexandria, Virginia, 1971.

   B. Leadership Training and Parliamentary Procedure for FFA, Jarrell D. Gray, and J. R. Jackson, Prentice-Hall, Inc., Englewood-Cliffs, New Jersey, 1958.

C. A Guide to Parliamentary Practices, Henderson and Rucker, The Interstae, Printers and Publishers, Danville, Illinois.

FUTURE FARMERS OF AMERICA
UNIT I

ANSWERS TO TEST

1. L a.
   E b.
   E c.
   L d.
   L e.
   E f.
   E g.
   L h.
   L i.
   E j.

(NOTE: Instructors, remember the answer sheet is to correspond with test questions.)

2. a. Supplies all official FFA merchandise
   b. Insures uniformity in official FFA merchandise
   c. Provides high-quality official merchandise

3. a. Treasurer
   b. Sentinel
   c. Reporter
   d. Advisor
   e. President
   f. Vice-President
   g. Secretary

4. 1 a.
   6 b.
   7 c.
   2 d.
   8 e.
   9 f.
   10 g.
   3 h.
   4 i.
   5 j.
   11 k.
   12 l.

5. Any five of the following:
    a. Radio and TV programs
    b. FFA Week articles in newspapers
    c. School assembly
    d. Civic club program
    e. Parent and son/daughter banquet
    f. Posters displayed around town
    g. Attend church as a group
    h. Window displays

6. a. President
    b. Secretary
    c. Advisor
    d. Sentinel
    e. Vice-President
    f. Treasurer
    g. Reporter

BECOMING A GOOD LEADER
UNIT II

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objectives sheet
- B. Provide students with information sheet
- C. Discuss terminal and specific objectives
- D. Discuss information and assignment sheets
- E. Help evaluate the student according to the Personality Self-Rating Scale
- F. Give test

II. Student:

- A. Read Objectives
- B. Study information sheets
- C. Demonstrate the ability to accomplish the procedures in the assignment sheets
- D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objective sheet
- B. Information sheet
- C. Assignment sheets
  - #1 - Personality Self-Rating Scale
  - #2 - Identifying Leaders Within Your Community
- D. Test
- E. Answers to test

II. References:

- A. Official Manual, Future Farmers of America, Alexandria, Virginia, 1969.
- B. Leadership Training and Parliamentary Procedure for FFA, Jarrell D. Gray, and J.R. Jackson, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1958.

C. Animal Science, Missouri State Department of Education, Agricultural Education Section, University of Missouri, Columbia, Missouri.

D. Chapter Guide to FFA Activities.

BECOMING A GOOD LEADER
UNIT II

ANSWERS TO TEST

1. The combination of qualities which inspires confidence, draws others toward the leader, and causes them to follow.

2. __X__ a.

   __X__ b.

   _____ c.

   __X__ d.

   _____ e.

   __X__ f.

   __X__ g.

3. Discussion should include the following:
   a. Leadership needed in all fields
   b. Challenge to learn
   c. Creates respect for others
   d. Aids in maturity
   e. Other items that instructor felt was necessary

4. Any four of the following:
   a. Leaders are made, not born
   b. Study qualities of a good leader
   c. Evaluate weak and strong points of yourself
   d. Become a good follower
   e. Develop a plan for training yourself as a leader

5. Any five of the following:
   a. Education
   b. Respect
   c. Advancement in an occupation
   d. Financial betterment
   e. Pride
   f. Security

ANALYSIS AND EVALUATION OF THE ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

SUGGESTED ACTIVITIES

I. Instructor:
   A. Provide students with objective sheet
   B. Provide students with information and assignment sheets
   C. Discuss terminal and specific objectives
   D. Discuss information and assignment sheets
   E. Hand each student a summary sheet outline
   F. Give test

II. Students:
   A. Read objectives
   B. Study information sheets
   C. Complete the summary sheet
   D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   A. Objectives
   B. Information sheets
   C. Assignment sheets
      Assignment sheet #1 - Completing The On-Job-Experience Evaluation Sheet
      Assignment sheet #2 - Kansas Vocational Education Training Agreement
   D. Test
   E. Answers to test

II. References:
   A. Kansas Vocational Agriculture Agribusiness Record Book. Interstate Printers and Publishers Inc., Danville, Illinois.

B. Cooperative Vocational Education. State Department of Vocational and Technical Education; Stillwater, Oklahoma.

C. Amberson, Max L. and B. Harold Anderson. Learning Through Experience in Agricultural Industry. McGraw Hill Inc. c. 1978.

ANSWERS TO ASSIGNMENT SHEET #2

(This is a sample filling out of the form. The student's forms should be filled out similarily and to the instructor's satisfaction.)

KSDE Form #0-03-03-106
Date 2/80

I. a. Program is:
(Please check one)
X Secondary
___ Post Secondary

b. Please check one:
X Agriculture
___ Distributive Education
___ Health
___ Business/Office Education
___ Home Economics
___ Industrial Education
___ Special Voc-Ed Program
___ Included more than one service area

KANSAS VOCATIONAL EDUCATION TRAINING AGREEMENT

II. The Crossroads Elevator (a) Training Station will permit Jonathan Swift (b) Student,

a student in the Production Agriculture (c) Program Program at

Allenville High School (d) School, LEA No. 123 to enter

this establishment for the purpose of gaining training of experience as (a) (an) Spray Foreman (f) Occupation 01.02 (g) U.S.O.E. Code

at $3.75/hour (h) Taxed Wage. The supervised on-the-job training

period will begin the 3 (i) day of September, 19 82;

classroom instruction will begin the 28 day of August, 19 82, and extend through the 27 day of May, 19 83. The program is designed to operate during the nine-month school year. Students should work an average of 15 hours each week throughout the school year, accumulating a minumum of 450 hours. The students should receive training or experience in a variety of areas which gradually progresses in difficulty. The training will be in accordance with an attached outline of Job Tasks, made and agreed upon by the employer, instructor-coordinator, and student.

Ag. II - 16-C

General Provisions of Training

1. Supervised occupational experience, which includes related classroom instruction, is an integral part of an approved vocational education program. FOR SECONDARY PROGRAMS, PARTICIPATION IN VOCATIONAL STUDENT ORGANIZATIONS IS ALSO INCLUDED.

2. Status of the student shall be that of student-trainee, who does not displace a full-time worker.

3. The employer will rate the student's supervised occupational experience performance 6 times a year.

4. The instructor-coordinator will assist with adjustment of problems encountered on the job. The student should communicate all classroom and on-the-job concerns to the instructor-coordinator. FOR SECONDARY PROGRAMS, THE PARENT MAY ALSO COMMUNICATE SUCH CONCERNS TO THE INSTRUCTOR-COORDINATOR.

5. For post secondary, this agreement may be terminated for just cause by any or all parties concerned; the instructor-coordinator must be notified. FOR SECONDARY, THIS AGREEMENT MAY BE TERMINATED BY THE INSTRUCTOR-COORDINATOR OR THE EMPLOYER.

6. Safety instructions shall be given in the classroom and at the work station.

7. All parties should encourage both classroom and on-the-job attendance.

FOR SECONDARY ONLY

8. Duties declared hazardous shall be incidental to training, intermittent, and under direct and close supervision. (Child Labor Bulletin No. 101: Nonagricultural Hazardous Occupations Orders Nos. 5, 8, 10, 12, 14, 16, and 17 contain exemptions for apprentices and student-learners.)

9. Upon student completion of or withdrawal from the program, the employer will no longer be eligible for student Targeted Jobs Tax Credit (TJTC). Please see Internal Revenue Service Publication 906, "Targeted-Jobs Tax Credit and Win Credit," for information.

III. Attach training plan

IV. ______________________ Firm
______________________ / August 29, 1982
Student Date

BY ______________________ 10-28-82
Employer/Supervisor Date

______________________ / ____
Parent/Guardian Date
(FOR SECONDARY ONLY)

______________________ 12-29-82
Instructor-Coordinator Date

V. Employers and Instructor-Coordinators must retain a copy of this form for (3) years, providing verification for tax credit and audits.

VI. White copy to training station--Yellow to Trainee--Green to State Department of Education--Pink to coordinator or school file.

An Equal Employment/Educational Opportunity Agency

VEK/8

ANALYSIS AND EVALUATION OF THE ON-JOB EXPERIENCE PROGRAM IN AGRIBUSINESS
UNIT I

ANSWERS TO TEST

1. Any three of the following:
    a. Aids in the planning for the future opportunities and rewards of a job
    b. Serves as a comparison between one or more job opportunities
    c. Identifies interests, strengths and weaknesses of the individual
    d. Provides an evaluation and appraisal of an agribusiness job

2. Any six of the following:
    a. Physical requirements
    b. Educational requirements
    c. Environmental conditions to work with
    d. Starting and projected salary and other monitary benefits
    e. Future advancement and opportunities
    f. Living conditions the job would offer the family
    g. Was the job what I expected and was I happy?
        1. Why
        2. Suggestions for improvement

3. The student should use the chart on job evaluation sheet for comparison and obtain information from each student.

4. Completed to satisfaction of the instructor.

5. Completed to satisfaction of the instructor.

6. Completed to satisfaction of the instructor.

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet
- B. Provide students with information and assignment sheets
- C. Discuss terminal and specific objectives
- D. Discuss information and assignment sheets
- E. Make sure all the assignment sheets are completed

II. Students:

- A. Read objectives
- B. Study information sheet
- C. Complete all assignment sheets

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Supplemental Information Sheets
  - #1 - Salvage Values and Depreciation Methods
  - #2 - Depreciation Schedule - Machinery & Equipment
  - #3 - Depreciation Schedule - Breeding Livestock
  - #4 - Depreciation Schedule - Personal
  - #5 - Inventories
  - #6 - Inventory of Recievables & Payables
  - #7 - Inventory of Crops, Supplies, Land, and Other
  - #8 - Inventory of Livestock
  - #9 - Net Worth Statement
- D. Assignment Sheets
  - #1 - Steps to Follow in Opening Your New Record Book
  - #2 - Depreciation Schedule - Machinery & Equipment
  - #3 - Depreciation Schedule - Breeding Livestock
  - #4 - Depreciation Schedule - Personal
  - #5 - Inventory of Recievables & Payables
  - #6 - Inventory of Crops, Supplies, Land, and Other
  - #7 - Inventory of Livestock
  - #8 - Record Book Grade Sheet

E. Test

II. References:

A. Kansas Vocational Agriculture Record Book(Production and/or Agribusiness)

B. Farm Records - A Management Tool, Ohio Agricultural Ed. Curriculum Materials Service, Ohio State University.

C. Farm Records - A Tool for Business Management, Cooperative Extension Service, Kansas State University, Manhattan, KS.

D. Setting Up Records to Provide For Analysis, VAS 2037, Vocational Agriculture Service, University of Illinois.

E. Farm Record Keeping with the Kansas Farm Account Book, Cooperative Extension Service, Kansas State University, Manhattan, Kansas.

F. Record keeping on the Farm, Vocational Agriculture Service, University of Illinois.

G. Farm Business Planning and Analysis Program and Teaching Units, Ohio Agriculture Education Curriculum Materials Service, Ohio State University.

RECORD KEEPING -
OPENING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

The assignment sheets should be completed to the instructors satisfaction.

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet
- B. Provide students with information and assignment sheets
- C. Discuss terminal and specific objectives
- D. Discuss information and assignment sheets
- E. Make sure all the assignment sheets are completed

II. Students:

- A. Read objectives
- B. Study information sheet
- C. Complete all assignment sheets

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Transparency masters
    - TM 1 - Kansas Vocational Agriculture Record Book Accuracy Check
    - TM 2 - Vo-Ag Record Book Summary
- D. Assignment sheets
    - #1 - Steps to Follow in Closing Out Record Book
    - #2 - Kansas Vocational Agriculture Record Book Accuracy Check
    - #3 - Vo-Ag Record Book Summary
- E. Answers to assignment sheets
- F. Test

II. References:

- A. Kansas Vocational Agriculture Record Book (Production and/or Agribusiness)

RECORD KEEPING -
CLOSING THE VOCATIONAL-AGRICULTURE RECORD BOOK
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

All of the assignment sheets should be completed to the instructor's satisfaction.

PLANNING AND IMPLEMENTING SUPERVISED ON-JOB EXPERIENCE PROGRAMS FOR AGRIBUSINESS
UNIT IV

SUGGESTED ACTIVITIES

(NOTE: This unit is designed for students having programs in agribusiness)

I. Instructor:

A. Provide students with objective sheet

B. Provide students with information and assignment sheets

C. Discuss terminal and specific objectives

D. Evaluate completed assignment sheets

E. Give additional sheets for record book

II. Students:

A. Read objectives

B. Study information sheets

C. Complete assignment sheets

D. Hand in completed assignment sheets for evaluation

E. Staple completed assignment sheets in record book

INSTRUCTIONAL MATERIALS

I. Included in this unit:

A. Objectives

B. Information sheets

C. Assignment sheets

#1 - Occupational objective page
#2 - Supervised occupational experience agreement
#3 - Specific experiences to be gained
#4 - Other information

II. References:

A. Kansas Agribusiness Record Book

B. National Proficiency Awards for 79-80: Placement in Sales and Services; Placement in Processing; American Farmer and Agribusinessman.

C. Amberson, Max L. and B. Harold Anderson, Learning Through Experience in Agricultural Industry. McGraw Hill Inc. c. 1978

FARM CREDIT
UNIT V

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide students with objective sheet.

   B. Provide students with information and assignment sheets.

   C. Make transparencies.

   D. Discuss terminal and specific objectives.

   E. Discuss information and assignment sheets.

   F. Arrange for appropriate resource people.

   G. Give test.

II. Student

   A. Read objectives.

   B. Study information and assignment sheets.

   C. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheet

   C. Supplemental Information Sheets

   D. Transparency masters

      TM 1 - Check Writing

   E. Assignment sheets

      #1 - Writing Checks
      #2 - Calculating Interest Rates
      #3 - Calculating Differences of 1% in Interest Rates

   F. Answers to assignment sheets

   G. Test

   H. Answers to test

FARM CREDIT
UNIT V

ANSWERS TO ASSIGNMENT SHEET #2

1. Farmer "A" - 16.0% interest
2. Farmer "B" - 9.3% interest
3. Farmer "C" - 7.6% interest

FARM CREDIT
UNIT V

ANSWERS TO ASSIGNMENT SHEET #3

1. 30 yrs X 12 months = 360 months
   360 months X $877.58 = $315,928.80

2. 30 yrs X 12 months = 360 months
   360 months X $952.34 = $342,842.40

3. $342,842.40 - $315,928.80 = $26,913.60

FARM CREDIT
UNIT V

ANSWERS TO TEST

1. a. Lien - A legal claim against property, usually proven by a mortgage, a security agreement, a sales contract, or other written contracts

   b. Consumer credit - The services bought that are used up or consumed and do not directly improve the earning capacity or financial condition of the borrowers

   c. Check - A signed written order on a bank to pay a certain sum of money on demand to the bearer of the check or to the order of a named person

   d. Warehouse receipt - A receipt given by a warehouseman for goods received by him for storage in his warehouse

   e. Credit - A desirable and useful farm tool when it will improve the economic and social well-being of the farm family

2. a. Personal characteristics

   b. Financial position

   c. Repayment capacity

   d. Purpose of loan

   e. Security for loan

3. Any five of the following:

   a. Merchants or dealers

   b. Individuals

   c. Commercial banks

   d. Insurance companies

   e. Federal Land Banks

   f. Farmers Home Administration

   g. Production Credit Association

4. a. Character

   b. Lending policies

   c. Permanence and dependability

   d. Experience and knowledge of farming

   e. Cost of the loan

5. a. Financing crop and livestock production
   b. Financing land
   c. Financing farmers' cooperatives

6. a. An additional income
   b. An increase in size of operation
   c. A product price rise
   d. A sufficient repayment capacity
   e. An individual's ability as a manager

7. Any five of the following:
   a. Business too small
   b. Low production per unit
   c. Low price per unit sold
   d. High cash production costs
   e. High cash overhead
   f. High cash living costs
   g. Borrowing above ability to repay
   h. Overestimating the amount of the loan

8. a. Warehouse receipt
   b. Check
   c. Draft
   d. Promissory note

9. Any five of the following:
   a. Written in ink
   b. Written plainly
   c. Written to prevent space between dollar sign and check amount
   d. Amount spelled out in writing
   e. Never made payable to cash
   f. Blank check never signed
   g. Check voided if mistake is made
   h. What check was given for
   i. Information about check recorded in register

10. 4.1% interest

ELEMENTARY STUDY OF SOILS
UNIT I

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide students with objective sheet

  B. Provide students with information sheet

  C. Obtain soil science transparency masters from California State Polytechnic College

  D. Obtain a county soil survey map from local extension service or soil conservation service

  E. Make transparencies

  F. Discuss terminal and specific objectives

  G. Discuss information sheet

  H. Conduct field trip to study soils

  I. Give test

II. Students:

  A. Read objective sheet

  B. Study information sheet

  C. Complete assignment sheet to the satisfaction of the instructor

  D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objectives

  B. Information sheet

  C. Transparency masters

    TM 1 - Types of Physical Weathering
    TM 2 - Soil Particles
    TM 3 - Soil Profile
    TM 4 - Soil Profile
    TM 5 - Soil Structure
    TM 6 - Composition of Average Soil

  D. Assignment sheet

    #1 - Study of My County Soil

E. Test

F. Answers to test

II. References:

A. Soils of Kansas (map), Kansas Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

B. Instructional Materials for Vocational Agriculture I, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

C. Fundamentals of Soil Science, Charles Earnest Millar, Lloyd M. Turk, H.D. Foth, John Wiley and Sons, Inc., New York, N.Y.

D. Introductory Soils, Kermit C. Berger, The MacMillan Company, New York, New York.

E. Our Soils and Their Management, Roy L. Donahue, The Interstate Printers and Publishers, Inc., Danville, Illinois.

F. Soil Structure, Vocational Agriculture Service, University of Illinois, Urbana, Illinois.

G. "Use Stubble Mulch to Control Erosion in Western Kansas", SC-411, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

H. "Instructions on Land Judging and Homesite Evaluation", XMF-332, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

I. "Soil Erosion is Still a Problem in Kansas", XMF-411, Cooperative Extension Service & Agricultual Experiment Station, Kansas State University, Manhattan, Kansas 66506.

ELEMENTARY STUDY OF SOILS
UNIT I

ANSWERS TO ASSIGNMENT SHEET #1

The questions should be answered to the instructor's satisfaction.

ELEMENTARY STUDY OF SOILS

ANSWERS TO TEST

1. a. The mineral and organic material that support plant growth on the earth's surface.
   b. The size of the individual soil particles such as sand, silt, and clay.
   c. A more or less consolidated mass composed of two or more minerals.
   d. A single mass or cluster of soil particles such as a clod, crumb, or granule.
   e. The way the individual soil particles are grouped together to form clusters or particles.

2. a. Provide food
   b. Provide shelter
   c. Provide energy

3. a. Parent materials
   b. Weathering
   c. Climate
   d. Vegetation and organisms
   e. Slope and drainage

4. a. Physical
   b. Chemical

5. Any five of the following:
   a. Makes soil porous
   b. Supplies nitrogen to the plant
   c. Holds water in the soil
   d. Furnishes food for the soil organisms
   e. Stores mineral nutrients
   f. Reduces leaching
   g. Stabilizes soil structure

6. a. Sand
   b. Silt
   c. Clay

7. a. Topsoil
   b. Subsoil
   c. Parent material

8. a. Platy
   b. Granular
   c. Crumb
   d. Prismatic
   e. Angular
   f. Columnar
   g. Subangular blocky

9. a. 3
   b. 1
   c. 2
   d. 4

10. a. Air 25%
    b. Mineral matter 45%
    c. Water 25%
    d. Organic matter 5%

11. A.		B.		C.		D.	
1.	f	1.	b	1.	d	1.	c
2.	e	2.	a	2.	a	2.	d
3.	c	3.	d	3.	c	3.	a
4.	a	4.	c	4.	b	4.	b
5.	b						
6.	d						

SOIL CONSERVATION PRACTICES
UNIT II

SUGGESTED ACTIVITIES

I. Instructor

- A. Provide students with objective sheet.
- B. Provide students with assignment and information sheets.
- C. Make transparencies.
- D. Discuss terminal and specific objectives.
- E. Discuss assignment and information sheets.
- F. Take field trip to observe poor conservation practices in the community.
- G. Have resource personnel speak to class.
- H. Give test.

II. Students

- A. Read objectives.
- B. Study information sheet.
- C. Participate in field trip.
- D. Complete assignment sheet and turn in to the instructor.
- E. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Transparency masters
  - TM 1 - Wind Erosion Control Measures
  - TM 2 - Terracing for Erosion Control
  - TM 3 - Strip Cropping for Erosion Control
  - TM 4 - Crop Rotation for Erosion Control
- D. Assignment sheets
  - #1 - Locating Poor Conservation Practices
- E. Test
- F. Answers to test

II. References:

A. Fundamentals of Soil Science, Charles Earnest Millar, Lloyd M. Turk, H.D. Foth, John Wiley and Sons, Inc., New York, New York.

B. Introductory Soils, Kermit C. Berger, The MacMillan Company, New York, New York.

C. Instructional Materials for Vocational Agriculture I, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

D. Our Soils and Their Management, Roy L Donahue, The Interstate Printers and Publishers, Inc., Danville, Illinois.

E. "How to Reduce Dust Storms", SC-318, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

F. "Reducing Soil Erosion with Residue Management", SC-403, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

G. "Controlling Wind Erosion", SC-409, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

H. "Wind Erosion Control in South Central and Southwestern Kansas", SC-410, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

I. "Use Stubble Mulch to Control Erosion in Western Kansas", SC-411, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

SOIL CONSERVATION PRACTICES
UNIT II

ANSWERS TO TEST

1. a. Terracing - A structure designed to slow down running water and control erosion on sloping land.
   b. Cover Crop - A crop used to cover the soil surface to decrease erosion.
   c. Erosion - The removal of topsoil by wind and water.
   d. Diversion Ditch - Ditch which prevents erosion by diverting water around a field rather than across.
   e. Water Outlet - A ditch which carries the excess water off the farm.

2. a. Wind
   b. Water

3. Any five of the following:
   a. Strip cropping
   b. Prevention of burning
   c. Prevention of overgrazing
   d. Moisture conservation
   e. Emergency cover crops
   f. Emergency tillage operations
   g. Wind break tree planting
   h. Shelter belt of trees
   i. Stubble mulching

4. a. Splash
   b. Sheet
   c. Rill
   d. Gully

5. a. Amount of intensity of rain or wind and/or type and condition of vegetative cover.
   b. Nature of soil and/or slope

6. X a. Moisture
___ b. Temperature
X c. Fertility
X d. Slope
X e. Drainage

7. a. Use of land
b. Water disposal systems
c. Cover crops
d. Control of gullies
e. Fertilizer

8.

Terrace Type	Function
a. Channel	Primarily for drainage
b. Ridge	Primarily to increase water absorption
c. Bench	Slow down runoff

9. Contour - farm parallel to terraces

PLANT GROWTH AND REPRODUCTION
UNIT III

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide student with objective sheet

   B. Provide student with information sheet

   C. Make transparencies

   D. Discuss terminal and specific objectives

   E. Discuss information sheets

   F. Plant seeds to demonstrate how germination occurs

   G. Conduct field trip to demonstrate the process of pollination

   H. Give test

II. Students

   A. Read objective sheet

   B. Study information sheet

   C. Observe seed during the process of germination

   D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheet

   C. Transparency masters

      TM 1 - Parts of Plant
      TM 2 - Root Types
      TM 3 - Germination of a Bean Seed
      TM 4 - Germination of a Corn Seed
      TM 5 - Photosynthesis
      TM 6 - Cross Pollination
      TM 7 - Self-Pollination
      TM 8 - Pollination by Insects
      TM 9 - Parts of Stem
      TM 10- Parts of Flower
      TM 11- Respiration vs. Photosynthesis

   D. Test

   E. Answers to test

II. References

A. Crop Production, Harold D. Hughes, Edwin R. Henson, The Macmillan Company, New York.

B. Producing Farm Crops, Harold K. Wilson, A. Chester Richer, The Interstate Printers and Publishers, Inc., Danville, Illinois.

C. Plant Science, State Department of Education, Agriculture Education Section, University of Missouri, Agricultural Ed. Department.

D. Instructional Materials for Vocational Agriculture I, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

E. "When to Expect Late-Spring and Early-Fall Freezes", SB-415, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

F. "An Easy Method of Estimating Potential Evapotranspiration", SRL-30, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

PLANT GROWTH AND REPRODUCTION
UNIT III

ANSWERS TO TEST

1. Define:
   - a. Pollination - The transfer of pollen from the anther to stigma
   - b. Respiration - The taking in of oxygen and giving off of carbon dioxide
   - c. Dicotyledon - A plant which produces two seed leaves
   - d. Pollen - The male sex cells produces in the anthers of flowering plants
   - e. Pistil - The seed-bearing organ of a flower composed of the ovary, style and stigma

2. a. Absorption of water and oxygen into the seed
   - b. Seed swells and seed coat ruptures
   - c. Primary (temporary) root goes down
   - d. First internode goes up
   - e. New leaves form and food production starts

3. a. Light
   - b. Temperature
   - c. Moisture

4. Any three of the following:
   - a. Mechanical injury
   - b. Disease
   - c. Storage conditions
   - d. Old seed
   - e. Temperature too cold
   - f. Hard seed coat
   - g. Drying out of seed
   - h. Planting too deep
   - i. Chemical damage
   - j. Immature seed

5. a. Light
   b. Favorable temperature
   c. Living cells containing chlorophyll

6. a. Diffusion
   b. Osmosis
   c. Non-root feeding

7. b
   c
   f

8. a. Tubes
   b. Root
   c. Stolon
   d. Stem
   e. Rhizomes

9. Paragraph should consist of the following statements:
   a. Photosynthesis builds energy
   b. Photosynthesis manufactures food
   c. Photosynthesis gives off oxygen
   d. Photosynthesis produces sugars, starches
   e. Respiration is a destruction process
   f. Respiration uses food
   g. Respiration gives off CO_2

10. a. CO_2 taken in by leaves
    b. H_2O taken in by roots
    c. $CO_2 + H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + O_2$

11. a. Roots - Any two of the following:
       1. Absorb water and minerals
       2. Store food
       3. Anchor plant

b. Stems - Any two of the following:
    1. Support leaves
    2. Aid in manufacturing plant food from leaves
    3. Serve as food storage area
c. Buds or flowers
    1. Reproduction
    2. Store food
d. Leaves - Any two of the following:
    1. Manufacture food
    2. Transpiration occurs
    3. Store food

12. a. Taproot
    b. Fibrous

13. a. Pollen grains
    b. Tube nucleus
    c. Pollen grains in anther
    d. Pollen tube
    e. Ovule
    f. Embryo sac
    g. Micropyle
    h. Receptacle
    i. Stigma
    j. Sperms
    k. Style
    l. Anther
    m. Filament
    n. Petal
    o. Ovary
    p. Sepal

14. a. Terminal bud
    b. Auxiliary bud
    c. Petiole
    d. Abcission layer
    e. Internode
    f. Nodes

15. a. Roots
    b. Stem
    c. Leaf
    d. Bud

SEED SELECTION
UNIT IV

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet
- B. Provide students with information and assignment sheets
- C. Make transparencies
- D. Discuss terminal and specific objectives
- E. Discuss information and assignment sheets
- F. Conduct field trip to allow students to collect noxious weeds
- G. Give test

II. Students:

- A. Read objectives
- B. Study information sheets
- C. Complete assignment sheet and turn in to the instructor
- D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheets
- C. Transparency masters

  TM 1 - Prohibited Noxious Weeds
  TM 2 - Restricted Noxious Weeds
  TM 3 - Seed Label Requirements
- D. Assignment sheet

  #1 - Collecting and Identifying Noxious Weeds
- E. Test
- F. Answers to test

II. References:

A. Send request for rules and regulations for specific crops to: Kansas Crop Improvement Association, Call Hall, Kansas State University, Manhattan, Kansas 66506.

B. Seeds, The Yearbook of Agriculture, The United States Dept. of Agriculture, Washington, D.C.

C. Crop Production, Harold D. Hughes, Darrel S. Metcalf, Iver J. Johnson, The Macmillan Company, New York, New York.

D. Instructional Materials for Vocational Agriculture I, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

E. "Weeds of the North Central States", NCR-36, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

F. "Chemical Weed Control in Horticultural and Forestry Plants", SRP-344, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

SEED SELECTION
UNIT IV

ANSWERS TO TEST

1. a. Registered seed - The seed that is directly from the originator of a new variety or from previously registered seed and has been certified by a certifying agency to insure varietal indentity and genetic purity
   b. Foundation seed - Seed stocks that are handled so as to assure varietal identity and most nearly maintain genetic purity and that have been certified by a certifying agency or agriculture experimental station
   c. Breeder seed - The seed used by the breeder to maintain the strain or variety
   d. Seed - A plant embryo and stored food materials surrounded by a seed coat
   e. Pure seed - The percentage of seed that will produce plants true to variety and type

2. a. Size and plumpness
   b. Color of seed coat
   c. Free of disease
   d. Free of broken seeds and noxious weeds
   e. Free of insects

3. a. 2
   b. 2
   c. 2
   d. 1
   e. 1
   f. 2
   g. 1
   h. 2
   i. 1
   j. 2
   k. 2
   l. 1
   m. 1
   n. 2
   o. 1
   p. 1

4. a. Use certified seeds first planting
   b. Select clean-grown seeds
   c. Control weeds
   d. Prevent seeds from mixing

- e. Store in cool, dry place
- f. Treat seeds for insects and disease control
- g. Test seeds for germination
- h. Inspect seed during storage

5. a. Home grown
    - b. Reliable seed dealers

6. a. Kind, variety, and origin
    - b. Lot number
    - c. Percentage of purity
    - d. Percentage of inert matter
    - e. Percentage of weed seed
    - f. Percentage of other agricultural seeds

LAND PREPARATION
UNIT V

SUGGESTED ACTIVITIES

I. Instructor:
  - A. Provide students with objective sheet
  - B. Provide students with information sheet
  - C. Discuss terminal and specific objectives
  - D. Discuss information and assignment sheets
  - E. Provide students with implement catalogs
  - F. Take field trip to machinery dealer
  - G. Give test

II. Students:
  - A. Read objectives
  - B. Study information sheet
  - C. Complete assignment sheet and turn into instructor
  - D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:
  - A. Objectives
  - B. Information sheet
  - C. Supplemental information sheets
  - D. Assignment sheet
    #1 - Collecting Pictures of Land Preparation
  - E. Test
  - F. Answers to test

II. References:
  - A. Crop Production, Harold D. Hughes, Edwin R. Henson, The MacMillian Company, New York, New York.

B. Instructional Materials for Vocational Agriculture I, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

C. Experiences with Minimum Tillage, Lowell A. Burchett, Secretary, KCIA, KSU, Manhattan, Kansas.

D. Machinery Booklets from local implement dealer.

E. Bishop, Douglas D. , Stephen R. Chapman, and Lark P. Carter, Working in Plant Science., McGraw Hill Inc. c. 1978

LAND PREPARATION
UNIT V

ANSWERS TO TEST

1. a. Humus - Decomposed plant residue
   b. Stubble mulching - The tillage beneath the stubble without covering all of the residue
   c. Crop residue - The part of the crop that is left on the ground after harvesting
   d. Erosion - The removal of the topsoil by wind and water

2. a. Eliminate weeds
   b. Increase soil's chemical and biological condition
   c. Improve physical condition of tight soils

3. Any five of the following:
   a. Clean
   b. Firm
   c. Mellow
   d. Free of trash and weeds
   e. Free of disease
   f. Free of insects

4. a. Types of crop
   b. Weed problem
   c. Erosion
   d. Moisture

5. Any two of the following:
   a. Increase time for crop residues to decay
   b. Reduce tillage load
   c. Improve chances of forming a firm seedbed

6. Any four of the following:
   a. Add organic matter to the soil
   b. Increase food elements
   c. Increase microorganism action
   d. Reduce erosion
   e. Maintain air circulation and controls temperature

7. a. Conserve moisture
   b. Control weeds

8. A. 1. Reduce erosion
      2. Increase moisture intake
      3. Increase crop yields
   B. Any two of the following:
      1. Provides habitat for overwintering disease organisms
      2. Provides habitat for overwintering insects
      3. May require alterations in planting equipment and techniques

9. a. Chisel plow
   b. Spike-tooth harrow
   c. Moldboard plow
   d. Tandem disk

10. Any two of the following:
    a. Flexibility in planting date and soil moisture conditions
    b. Soil tilth is improved
    c. Water run-off and soil erosion is reduced
    d. Machinery, power and labor requirements are reduced

11. Any three of the following:
    a. Moisture loss
    b. Increases soil erosion
    c. Crusting is increased
    d. Compaction of subsoil
    e. Assures germination of weed seeds
    f. Waste of machinery, labor, and fuel,

CHEMICAL WEED CONTROL
UNIT VI

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheet.
   - B. Provide students with information sheets.
   - C. Discuss terminal and specific objectives.
   - D. Discuss information and assignment sheets.
   - E. Take field trip.
   - F. Teach unit on chemical safety before teaching this unit.
   - G. Give test.
   - H. Display sample herbicide packages.
   - I. Discuss chart showing yield results of different application rates.

II. Students:
   - A. Read objective sheet.
   - B. Study information sheets.
   - C. Demonstrate the ability to accomplish the procedures outlined in the assignment sheets.
   - D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objective sheet
   - B. Information sheets
   - C. Transparency masters
     - 1. TM 1 - Herbicide Classifications
     - 2. TM 2 - Application of Herbicides
     - 3. TM 3 - Nozzle Types
   - D. Assignment sheets
     - 1. Assignment Sheet #1 - Collecting and Identifying Needs
     - 2. Assignment Sheet #2 - Calculating Application Rates of Herbicides
   - E. Test
   - F. Answers to test

II. References:

A. Weed Control, Cultural and Chemical, Department of Agricultural Education, Ohio State University, Columbus, Ohio.

B. Instructional Materials for Vocational Agriculture II, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

C. Chemical Weed Control in Field Crops, Cooperative Extension Service, Kansas State University, Manhattan, KS #SRP-224.

D. Understanding Your Sprayer, Cooperative Extension Service, Kansas State University, Manhattan, KS #XE-415.

E. Sprayer Calibration Momograph, Cooperative Extension Service, Kansas State University, Manhattan, KS #XMF-415.

CHEMICAL WEED CONTROL
UNIT VI

ANSWERS TO ASSIGNMENT SHEET #2

1. 8 pounds of the 50% wettalbe powder required per acre
2. 5 pounds of the 80% wettable powder requried per acre
3. 20 gallons per acre

CHEMICAL WEED CONTROL
UNIT VI

ANSWERS TO TEST

1. a. Herbicides - A chemical developed to control weeds
   b. Label - A legal identification attached to containers of any commercially sold agricultural chemical giving a summary of its properties and uses
   c. Perennial - A plant that normally lives for more than two years
   d. Weed - A plant more harmful than beneficial in its location
   e. Soil herbicides - A herbicide applied directly to the soil

2. a. Seeds
   b. Roots
   c. Stems

3. a. Wind
   b. Water
   c. Animals
   d. Man

4. a. Soil nutrients
   b. Moisture
   c. Light
   d. Carbon dioxide

5. Any five of the following:
   a. Reduced crop yields
   b. Reduces quality of crops
   c. Increases production costs
   d. Increases labor and equipment costs
   e. Lowers land value
   f. Harbors diseases and insects
   g. Damages livestock and people

6. 1. c
   2. a
   3. d
   4. b

7. a. Applying herbicides before the crop is planted
   b. Applying chemicals before the crop or weeds emerge
   c. Applying chemicals after the crop or weeds emerge

8. a. Water-soluble concentrates
   b. Emulsifiable concentrates
   c. Flowables
   d. Wettable powders
   e. Granules and pellets

9. Any four of the following:
   a. Texture of soil
   b. Organic matter of soil
   c. Size and condition of crops
   d. Size and condition of weeds
   e. Available moisture

10. a. Sorghum
    b. Soybeans
    c. Pasture weeds
    d. Corn
    e. Sorghum

11. a. Climate
    b. State of plant growth
    c. Condition of plant

12. a. Regular flat fan
    b. Flooding type flat
    c. Hollow cone

13. a. Follow government recommendations
    b. Use according to label instructions
    c. Use of herbicides only on recommended crops
    d. Wear protective clothing
    e. Guard against injury to other plants
    f. Dispose of containers properly.

14. a. Bury glass and metal containers
    b. Burn paper containers

15. 8 lbs.

16. 6.19 gallons

PLANT INSECT CONTROL
UNIT VII

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheet.
   - B. Provide students with information sheets.
   - C. Make transparencies.
   - D. Discuss terminal and specific objectives.
   - E. Discuss information sheets.
   - F. Conduct a field trip.
   - G. Give test.
   - H. Display and discuss "sample" insecticide containers.

II. Students:
   - A. Read objective sheet.
   - B. Study information sheets.
   - C. Collect insects and complete assignment sheet.
   - D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objectives
   - B. Information sheets
   - C. Transparency masters
     1. TM 1 - Beneficial Insects
     2. TM 2 - Life Cycle of Insects
     3. TM 3 - Life Cycle of Insects
   - D. Assignment sheet
     1. Assignment Sheet #1 - Collecting and Identifying Insects
   - E. Test
   - F. Answers to test

II. References:

A. Instructional Material for Vocational Agriculture II, Teaching Materials Center, Agricultural Education Department, Texas A&M University, College Station, Texas.

B. Crop Production, Harold D. Hughes, Edwin R. Henson, The Macmillan Company, New York, New York.

C. Insects in Kansas, XB-94, Cooperative Extension, KSU, Manhattan, Kansas 66506.

D. "Insecticides", XC-376, Cooperative Extension, KSU, Manhattan, Kansas 66506.

E. "Kansas Field Crop Insect Control Recommendations", XC-431, Cooperative Extension, Manhattan, Kansas 66506.

F. "The Alfalfa Weevil", USDA Leaflet #368, Supt. of Documents, US Govt. Printing Office, Wash., D.C. 20402.

G. Bishop, Douglas D., Stephen R. Chapman, and Lark P. Carter. Working in Plant Science., McGraw Hill, Inc., c. 1978.

PLANT INSECT CONTROL
UNIT VII

ANSWERS TO TEST

1. a. 3
   b. 1
   c. 5
   d. 4
   e. 2

2. Any five of the following:
   a. Tillage, pasturing, and planting
   b. Rotation and selection of crops
   c. Planting dates
   d. Destruction of trach
   e. Quarantine areas
   f. Biological control
   g. Poison baits
   h. Chemical control

3. a. 2
   b. 1
   c. 1
   d. 2
   e. 2
   f. 1
   g. 2
   h. 2
   i. 1

4.

Harmful	Beneficial
1. b	1. a
2. d	2. c
3. e	3. f
4. g.	
5. h	

5. Discussion should mention the following:
    a. $1 billion needed per year to control insects
    b. Insects cause over $4 billion worth of damage to crops each year

6. a. Egg
    b. Larva
    c. Pupa
    d. Adult

7. a. Fumigant poison - enters the insect's body throught the tracheal system in the form of a gas
    b. Stomach poison - eaten and digested by the insect
    c. Contact poison - absorbed through the insect's skin or body wall and acts on the pest's nervous system

8. a. Natural
    b. Artificial

9.

INSECT	ADULT DESCRIPTION	DAMAGE	CROPS ATTACKED
Grasshopper	Varies according to species	Eats foliage, stripping plant	Corn, small grains
Fall Armyworm	Moth, gray-, white-, or dull-colored, 1 1/4" wing spread	Eats foliage	Wheat
Hessian fly	Mosquito-like fly, dark bodied, 1/10" long	Sucks juices from plants	Wheat
Alfalfa weevil	Snout beetle, 3/16" long, brown to black with faint lighter markings	Adults and larvae feed on growing tips, leaves, and buds	Alfalfa
Greenbug	Yellowish-green aphid, dark green stripe down back	Sucks sap, weakening and killing plant	Sorghum, wheat

PLANT DISEASES
UNIT VIII

SUGGESTED ACTIVITIES

I. Instructor:
  A. Provide students with objective sheet.
  B. Provide students with information sheets.
  C. Make transparencies.
  D. Discuss terminal and specific objectives.
  E. Discuss information sheets.
  F. Conduct field trips.
  G. Give test.

II. Students:
  A. Read objectives.
  B. Study information sheets.
  C. Collect plants showing disease damage.
  D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
  A. Objectives
  B. Information sheets
  C. Transparency masters
    1. TM 1 - Fungus Diseases
    2. TM 2 - Fungus Diseases
    3. TM 3 - Bacterial Diseases
    4. TM 4 - Bacterial Diseases
    5. TM 5 - Nematode Diseases
    6. TM 6 - Life Cycle of Smuts
  D. Assignment sheet
    1. Assignment Sheet #1 - Surveying for Plant Disease Damage
  E. Test
  F. Answers to test

II. References:

A. *Producing Farm Crops*, Harold K. Wilson, A. Chester Richer, The Interstate Printers and Publishers, Inc., Danville, Illinois.

B. *Crop Production*, Richard J. Belorit, Henry L. Ahlgren, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

C. *Crop Production*, Harold D. Hughes, Darrel S. Metcalfe, Iver J. Johnson, The Macmillan Company, New York.

D. *Compendium of Plant Diseases*, Rohm and Haas Company, Philadelphia, Pennsylvania.

E. Bishop, Douglas D., Stephen R. Chapman, and Lark P. Carter. *Working in Plant Science*. McGraw Hill Inc., c. 1978.

PLANT DISEASES
UNIT VIII

ANSWERS TO TEST

1. a. Host - The plant in which the disease lives and obtains food
   b. Resistant - The inherited ability of a plant to retard growth of disease organisms
   c. Wilt - The loss of freshness and drooping of leaves
   d. Blight - The rapid discoloration and death of tissue over certain portions of plants
   e. Fungicide - A chemical substance used to kill fungi

2. Any four of the following:
   a. Use of resistant varieties
   b. Eradication of alternate host plant
   c. Treatment of soil
   d. Rotation of crops
   e. Destruction of plant residue
   f. Use of disease-free seed

3. a. B
   c. F
   c. F
   d. B
   e. N
   f. F
   g. B
   h. N
   i. V
   j. B
   k. F

4. a. Seed produces plant but head is destroyed by smut
   b. Black head
   c. Spores
   d. Infect young
   e. Infectious seed

5.

Disease	Crops Affected	Symptoms	Control
Smut	Corn, Sorghum, Oats, Barley, Rye, Wheat	Grayish-white galls on any part of plant filled with mass of black spores at maturity	Crop rotation; use resistant hybrids; treat seeds
Rust	Wheat, Oats, Barley, Rye, Grasses	Long brick-red pustules on stems and leaf sheaths; later turn black	Use resistant varieties and early-maturing varieties
Ergot	Barley, Wheat, Rye	A blue-black, hard mass replaces the kernels in the head of the plant	Rotation; sow disease-free seed
Bacterial blight	Soybeans, Sorghum, Corn	Light to dark-brown irregular spots without marginal halo on leaves, stems, and pods	Destroy crop residue; seed treatment; use resistant varieties
Mosaic	Alfalfa, Soybeans	Plants may dwarf, vein yellowing with dwarfing of stems	Good insect control

6. a. Stalk rot
   b. Cotton leaf blight
   c. Root galls
   d. Smut

LANDSCAPING
UNIT IX

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide students with objective sheet

  B. Provide students with information and assignment sheets

  C. Make transparencies.

  D. Discuss terminal and specific objectives

  E. Discuss information and assignment sheets

  F. Conduct field trip to observe landscape plans

  G. Give test

  H. Discuss color slides taken at local landscapes - both good and poor

II. Students

  A. Read objectives

  B. Study information sheet

  C. Complete assignments and turn in for grade

  D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

  A. Objectives

  B. Information sheet

  C. Transparency masters

    TM 1--Major Areas of Landscape Plan
    TM 2--Basic Landscaping Symbols
    TM 3--Basic Landscaping Symbols
    TM 4--Basic Landscaping Symbols

  D. Assignment sheets

    Assignment sheet #1--Collecting and Identifying Trees and Shrubs
    Assignment sheet #2--Drawing a Landscaping Plan

  E. Test

  F. Answers to test

II. References

A. Principles of Horticulture, Ervin L. Denisen, The MacMillan Company, New York, New York.

B. Cooperative Extension Bulletins, KSU Extension Service, Manhattan Kansas, 66502.

1. Lawns in Kansas XC-327
2. Planning for a Better Community Landscape XC-369
3. Landscape Development for Urban Home XC-379
4. Site Planning for Home Landscape Development XC-381
5. Kansas Garden Guide XC-436
6. Landscape and Ornamental Trees for Northwest Kansas XC-440
7. Landscape and Ornamental Trees for Southwest Kansas XC-441
8. Ground Covers and Rock Gardern Plants XC-468
9. Shrubs for Kansas Landscape XC-469
10. Street Trees for Kansas Communities XC-481
11. Trees for Kansas Landscapes XC-482
12. Groundcovers and Rock Garden Plants XMF-321
13. Evergreens for Kansas Landscapes C-488
14. Landscaping, Sunset Books, Lane Magazine and Book, Co., Menlo Park, California 94025.
15. Windbreaks in Kansas L-141
16. Plants, Man, and Environment C-448
17. Homeowner Landscape Workshop - KSU
18. What Should I Plant C-292

C. Bishop, Douglas D., Stephen R. Chapman, and Lark P. Carter. Working in Plant Science. McGraw Hill Inc., c. 1978.

LANDSCAPING
UNIT IX

ANSWERS TO TEST

1. a. Evergreen plant - A plant that retains functional leaves throughout the year
   b. Conifers - Mostly evergreen trees and shrubs, including forms (as pines) with true cones, and others (as yews) with an arillate fruit
   c. Deciduous - The plants that have no living leaves during dormant season - shed their leaves seasonally
   d. Landscape design - The art of developing land for use and enjoyment in such a way to provide maximum utility and beauty
   e. Ground cover - A planting of low plants (as ivy) that covers the ground in place of turf

2. a. A plan enables one to think of the total landscape
   b. It helps to organize outdoor space relationships
   c. It is easier and cheaper to change mistakes on paper
   d. It allows development of the landscape to be budgeted

3. a. Use of the plant material in the landscape
   b. Time of flowering
   c. Mature size
   d. Shape
   e. Climatic conditions

4. a. Create privacy
   b. Screen objectionable views
   c. Beautify the farmstead
   d. Accent and enframe a building
   e. Provide shade and reduce glare

5. a. Do not over plant
   b. Do not cover the windows
   c. Plant large trees at least 20 feet from the house
   d. Shrub height should not exceed 2/3 distance from the ground to the eve of the house

6. a. Deciduous tree
   b. Evergreen tree
   c. Sheared hedge
   d. Groundcover or flower

7. a. T
   b. S
   c. T
   d. S
   e. T
   f. T
   g. S
   h. S
   i. S
   j. T
   k. T
   l. T
   m. S
   n. T
   o. S

8. a. Private
   b. Service
   c. Public

IRRIGATION
UNIT X

SUGGESTED ACTIVITES

I. Instructor:

- A. Provide students with objective sheet
- B. Provide students with information and assignment sheets
- C. Discuss terminal and specific objectives
- D. Discuss information and assignment sheets
- E. Give test

II. Students:

- A. Read objectives
- B. Study information sheet
- C. Complete assignment sheet and turn in for grade
- D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Transparency masters

  TM 1 - Irrigation Methods
  TM 2 - Drilled Well

- D. Assignment sheet

  #1 - Determining the Role of Water Flow Through Soil Textures

- E. Test
- F. Answers to test

II. References:

- A. Trickle Irrigation Design, J. Keller & D. Karmeli, Rain Bird Sprinkler Mfg. Corp., Glendora, California, 1975.
- B. Irrigation Principles and Practices, O. W. Isralsen & V. E. Hansen, John Wiley & Sons, Inc., New York. 1962, 3rd Edition.

C. Sprinkler Irrigation, 4th Edition. Claude H. Pair, Editor. The Irrigation Association, 13975 Connecticut Ave., Silver Spring, MD. 20906

D. Groundwater & Wells, Johnson Division, UOP Co., St. Paul, Minnesota, 1972.

E. Irrigated Soils, D. W. Thorne & H. B. Peterson, 2nd Edition, The Blakiston Co., New York, 1954.

F. Irrigation of Agricultural Lands, R. M. Hagen, H. R. Haise, T. W. Edminister, American Society of Agronomy, Madison, Wisconsin, 1967.

G. Surface Irrigation, L. J. Booher, Food & Agricultural Organization of the United Nations, FAO Agricultural Development Paper No. 95, 1974.

H. Planning for An Irrigation System, J. Howard Turner & Carl L. Anderson, American Association for Vocational Instructional Materials, 1971 (Available form Extension Agricultural Engineering, KSU, $6.75.)

I. Kansas Irrigation Guide and Irrigation Planners Handbook, Soil Conservation Service, Salina, Kansas 1977.

J. Sprinkler Irrigation Handbook, Rain Bird Sprinkler Manufacturing Corp., Glendora, California, 1970.

K. Water Wells and Pumps: Their Design, Construction, Operation and Maintenance. V. H. Scott and J. C. Scalmanini. Bulletin 1889, Division of Agricultural Sciences, University of California. May 1978.

IRRIGATION
UNIT X

ANSWERS TO TEST

1. 10 a.
   9 b.
   8 c.
   6 d.
   3 e.
   5 f.
   4 g.
   2 h.
   7 i.
   1 j.

2. a. Underground
   b. Sprinkler
   c. Surface
   d. Combination

3. a. Above ground
   b. Underground

4. Any three of the following:
   a. Concentration and composition of dissolved constituents in the water
   b. Drainage characteristics at the land to which water will be applied
   c. Drainage requirements
   d. Salinity hazards
   e. Sodium hazards
   f. Other hazards

5. 4 a.
   5 b.
   3 c.
   6/2 .
   7 e.
   6/2 f.

6. Discuss should include the following:
   a. Irrigation land in Kansas in 1978 was 3,414,981 acres
   b. Increases value per acre
   c. Increases crop production

7. q = quantity of water flow in cubic feet per second
   a = cross section are of water (in square feet)
   v = water velocity flowing through an opening or canal (in feet per sencond)

ANIMAL NUTRIENTS
UNIT I

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet
- B. Provide students with information sheet
- C. Discuss terminal and specific objectives
- D. Discuss information sheet
- E. Discuss with students job opportunities that are available with the feed industry
- F. Give test

II. Students:

- A. Read objective sheet
- B. Study information sheet
- C. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheet
- C. Transparency master

  TM 1 - Major nutrients
- D. Test
- E. Answers to test

II. References:

- A. Approved Practices in Feeds and Feeding, Daniel W. Cassard and Elwood M. Juergenson, The Interstate Printers and Publishers, Inc., Danville, Illinois.
- B. Morrison Feeds and Feeding, Frank B. Morrison, Morrison Publishing Company, Clinton, Iowa.
- C. Instructional Materials for Vocational Agriculture II, Teaching Materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.
- D. Nutrient Requirements for Beef Cattle, National Academy of

Sciences, Fourth Edition, 1970.

E. "Liquid Feed Supplement", XC-476, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University , Manhattan, Kansas 66506.

F. "Cow Herd Nutrition", XC-582, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

G. "Beef Cattle Nutrition", XC-583, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

ANIMAL NUTRIENTS
UNIT I

ANSWERS TO TEST

1. a. 6
   b. 4
   c. 1
   d. 3
   e. 2
   f. 5
   g. 7

2. a. Water
   b. Carbohydrates
   c. Fats
   d. Proteins
   e. Vitamins
   f. Minerals

3. a. A
   b. P
   c. P
   d. A
   e. A
   f. P
   g. A

4. a. 3
   b. 3
   c. 3,6,7
   d. 1,2
   e. 8
   f. 4,5

5. a. X
   b. X
   c. ____
   d. X
   e. ____
   f. ____
   g. X

6. Any three of the following:

a. Iron
b. Copper
c. Zinc
d. Iodine
e. Cobalt
f. Magnesium

7. A. Any four of the following:

a. Cottonseed meal
b. Linseed meal
c. Soybean meal
d. Skim milk
e. Tankage
f. Alfalfa hay

B. a. 2,3
b. 1,4,5

C. a. 6,5
b. 4,5
c. 2
d. 3
e. 1

D. a. 5,6
b. 4
c. 2
d. 1,6
e. 4

8. A. a. 2
b. 4
c. 1
d. 5
e. 3

B. a. 3
b. 1,7
c. 7
d. 2
e. 6,7
f. 4,5

9. a. Policies set by local feed firms
   b. Precautions when using feed additives
   c. FDA and State Standards and regulations
   d. Veterinarian recommendations

10. a. Stimulate weight gain
    b. Reduce feed required per unit of gain

11. Any two of the following:
    a. Stilbestrol
    b. Progesterone
    c. Testosterone

12. To increase weight gain and to help control disease.

13. Any two of the following:
    a. Aureomycin
    b. Terramycin
    c. Penicillin
    d. Streptomycin

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide students with objective sheet

   B. Provide students with information and assignment sheets

   C. Make transparencies

   D. Discuss objective sheet

   E. Discuss information sheet

   F. Demonstrate procedures for working problems contained in assignment sheets

   G. Give test

II. Students

   A. Read objectives

   B. Study information sheet

   C. Demonstrate the ability to accomplish the procedures in the assignment sheets

   D. Take test

   E. Obtain feed samples and feed analysis tags

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives sheet

   B. Information sheet

   C. Transparency masters

      TM 1 - Feed Composition
      TM 2 - Classification of Roughages
      TM 3 - Classification of Concentrates
      TM 4 - Commercial Feed Tag

   D. Supplemental Information Sheets

      #1 - Balancing Rations Using Pearson Square Method

   E. Assignment sheets

      #1 - Determining TDN and Digestible Protein Content of Basic Feeds
      #2 - Balancing Rations Using Pearson Square Method

#3 - Working a Sample Ration for a Fattening Beef Animal
#4 - Working a Sample Ration for Fattening Swine

F. Answers to assignment sheets

G. Test

H. Answers to test

II. References:

A. General Facts on Livestock Feeding, University of Illinois, Urbana, Illinois.

B. Morrison Feeds and Feeding, Frank B. Morrison, The Morrison Publishing Company, Clinton, Iowa.

C. Approved Practices in Feeds and Feeding, Daniel W. Cassard, Elwood M. Juergenson, The Interstate Printers and Publishers, Inc., Danville, Illinois.

D. Swine Feeds and Feeding, University of Illinois, Urbana, Ill.

E. Feeding Dairy Cattle, Farmers Bulletin No. 2153, United States Department of Agriculture.

F. Dairy Cattle Feeding and Management, H. O. Henderson, Paul M. Reaves, John Wiley and Sons, Inc., New York, London.

G. Feeds and Nutrition, M. E. Ensminger and C. S. Olentine, The Ensminger Publishing Company, Clovis, California.

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

I. A. 40.9 pounds TDN
B. 23.8 pounds TDN
C. 40.0 pounds TDN
D. 36.1 pounds TDN
E. 10.1 pounds TDN

II. A. 3.45 pounds DP
B. 2.55 pounds DP
C. 5.55 pounds DP
D. 3.50 pounds DP
E. 2.18 pounds DP

Assignment Sheet #2

I. 25.0 Parts of milo
7.5 Parts of cottonseed meal
33.5 Total parts

Assignment Sheets #3 & #4 - Instructor to supply answers

COMPOSITION AND CLASSIFICATION OF FEEDS
UNIT II

ANSWERS TO TEST

1. a. The feed crops cured and stored green or without drying.
   b. Anything which is added to a feed.
   c. The feeds which have a high proportion of digestible nutrients and not much fiber.
   d. The daily feed which an animal receives.
   e. The tough part of feed which is not very digestible.
   f. The organic compound consisting of C, H, O, N, and S, and sometimes P and Fe.

2. b. Dry Matter
   e. Protein
   f. Carbohydrates and Fats
   h. Crude Fiber
   i. Simple Sugar
   j. Compound Sugar

3. a. S
   b. C
   c. C
   d. S
   e. S
   f. C

4. a. 3
   b. 1
   c. 3
   d. 3
   e. 1 and 2
   f. 3
   g. 3
   h. 4

5. a. Minimum crude protein
   b. Minimum crude fat
   c. Maximum crude fiber

6. a. Weigh feed
   b. Dry in oven
   c. Weigh dried feed
   d. Subtract dried feed weight from feed weight
   e. Divide difference by the feed weight to obtain water content %

7. Any four of the following:
   a. Specific nutrient requirements for the livestock or poulty to be fed
   b. Palatability of the ingredients to be used
   c. Digestiblity of the ingredients available
   d. Vitamin content of the ingredients available
   e. Mineral content of the ingredients
   f. Availability of substitute ingredients
   g. Cost of the ingredients

8. a. Cost per pound of TDN
   b. Cost per pound of protein
   c. Cost of feed

9. Wheat

10. 7.5# milo
    44# tankage

ANIMAL DIGESTION
UNIT III

SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide students with objectives sheet

   B. Provide students with information sheet

   C. Make transparencies

   D. Discuss terminal and specific objectives with students

   E. Discuss information sheet

   F. Give test

II. Students:

   A. Read objectives sheet

   B. Study information sheet

   C. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheet

   C. Transparency masters

      TM 1 - Simple Digestive System of Swine
      TM 2 - Simple Digestive System of the Chicken
      TM 3 - Compound Digestive System of the Cow

   D. Test

   E. Answers to test

II. References:

   A. Approved Practices in Feeds and Feeding, Daniel W. Cassard and Elwood M. Juergenson, The Interstate Printers and Publishers, Inc., Danville, Illinois.

   B. Morrison Feeds and Feeding, Frank B. Morrison, Morrison Publishing Company, Clinton, Iowa.

   C. Dairy Cattle Feeding and Management, H. O. Henderson, Paul M. Reaves, John Wiley and Sons, Inc., New York, New York.

D. Beef Production, Clarence E. Bundy, Ronald V. Diggins, Prentice Hall, Inc., Englewood Cliffs, New Jersey.

E. "Feeding Egg-Producing Chickens", XC-392, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

F. "Cow Herd Nutrition", XC-582, Cooperative Extension Service & Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

ANIMAL DIGESTION
UNIT III

ANSWERS TO TEST

1. a. The process of preparing the food ingredients for passage into the blood stream.
   b. The grinding or chewing of feed to aid in digestion.
   c. The internal body secretions that regulate various body processes.
   d. The manure or the undigested material and wastes which are expelled at the end of the digestive tube.
   e. The chemical change which the food undergoes within the body.

2. A. Pig
      a. Pharynx
      b. Esophagus
      c. Stomach
      d. Small intestine
      e. Caecum
      f. Colon
      g. Large intestine
      h. Rectum
   B. Cow
      a. Anus
      b. Colon or large intestine
      c. Caecum
      d. Small intestine
      e. Rumen
      f. Abomasum
      g. Esophagus
      h. Pharynx
      i. Salivary ducts
      j. Reticulum
      k. Omasum
   C. Chicken
      a. Esophagus
      b. Crop
      c. Proventriculus
      d. Liver
      e. Gizzard
      f. Pancreas
      g. Duodenum
      h. Small intestine
      i. Large intestine
      j. Rectum
      k. Vent
      l. Cloaca
      m. Cecum

3. A simple stomach has one compartment, and a compound stomach has four compartments.

4.

a.	S	f.	R
b.	R	g.	S
c.	S	h.	S
d.	R	i.	S
e.	S		

5. Any three of the following:
   a. Digestion
   b. Metabolism
   c. Milk secretion
   d. Let-down of milk
   e. Development of sexual characteristics

6. a. Chewing or grinding of feed
   b. Secretion of saliva

7. a. Thyroid
   b. Parathyroid
   c. Pituitary
   d. Adrenal
   e. Pancreas

8. a. Mechanical
   b. Chemical

MAINTAINING ANIMAL HEALTH
UNIT IV

SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide students with objective sheet

   B. Provide students with information sheets

   C. Discuss terminal and specific objectives

   D. Demonstrate to the student the proper procedures for vaccinating an animal

   E. Give test

   (NOTE: Instructor may want to use a guest speaker or field trip to a farm or feedlot to contrast healthy and sick animals.)

II. Students:

   A. Study information sheets

   B. Apply proper sanitation practices to his home farm

   C. Vaccinate one animal each

   D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheets

   C. Transparency master

      1. TM 1 - Illustrations Showing Injection Points

   D. Test

   E. Answers to test

II. References:

A. Animal Science, M.E. Ensminger, Interstate Printers and Publishers, Danville, Illinois, 1965.

B. The Stockman's Handbook, M.E. Ensminger, Interstate Printers and Publishers, Danville, Illinois.

C. Livestock and Poultry Production, Clarence E. Bundy and Ronald V. Diggins, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

D. Texas Agricultural Education Instructional Materials, Texas Agricultural Education Teaching Materials Center, College Station, Texas.

E. Peterson, Paul, Allen C. Christenson, and Edward A. Nelson. Working in Animal Science. McGraw Hill Inc. c. 1978.

MAINTAINING ANIMAL HEALTH
UNIT IV

ANSWERS TO TEST

1. a. 4
   b. 5
   c. 1
   d. 3
   e. 2

2. Any five of the following:
   a. Proper housing and ventilation
   b. Proper manure disposal
   c. Control of rodents and birds
   d. Disinfectants
   e. Proper carcass disposal
   f. Proper isolation of new animals
   g. Pasture rotation
   h. Vaccination
   i. Parasite control

3. Any five of the following:
   a. Contentment
   b. Alertness
   c. Cudding by ruminants
   d. Sleek coat
   e. Bright eyes and pink eye membrane
   f. Normal temperature, pulse rate, and breathing rate

4. Any three of the following:
    a. Loss of appetite
    b. Rough hair coat
    c. Abnormal feces
    d. Not ruminating
    e. Dull eyes
    f. High temperature
    g. Discolored urine

5. a. 2
    b. 3
    c. 6
    d. 5
    e. 4
    f. 1

6. a. Cleanliness of area before applying disinfectant
    b. Killing strength of the disinfectant
    c. Dilution at which the disinfectant is used
    d. Thoughness of application

7. A. a. 2
        b. 4
        c. 1
        d. 3
        e. 5
        f. 6
    B. a. Intraperitoneal
        b. Oral
        c. Intramuscular
        d. Intravenous
        e. Subcutaneous
        f. Udder

8. a. Animal disease eradication division
    b. State veterinarians
    c. State sanitary commissions
    d. State agricultural boards

DISEASES
UNIT V

SUGGESTED ACTIVITIES

I. Instructor

A. Provide students with objective sheet

B. Provide students with information sheet

C. Discuss terminal and specific objectives

D. Discuss information sheet

E. Give test

II. Students

A. Read objective sheet

B. Study information sheet

C. Take test

INSTRUCTIONAL MATERIAL

I. Included in this unit:

A. Objectives

B. Information sheet

C. Test

D. Answers to test

II. References:

A. Instructional Materials for Vocational Agriculture I, Teaching materials Center, Agricultural Education Department, Texas A & M University, College Station, Texas.

B. Beef Production, Ronald V. Diggins, Clarence E. Bundy, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

C. Swine Production, Clarence E. Bundy, Ronald V. Diggins, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

D. Dairy Production, Clarence E. Bundy, Ronald V. Diggins, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

E. Animal Science, M.E. Ensminger, The Interstate Printers and Publishers, Inc., Danville, Illinois.

F. Beef Cattle, Rascoe R. Snapp, John Wiley, and Sons, Inc., New York, New York.

G. Animal Sanitation and Disease Control, R.R. Dykstra, The Interstate Printers and Publishers, Danville, Illinois.

H. Peterson, Paul, Allen C. Christenson, and Edward A. Nelson. Working in Animal Science. McGraw Hill Inc., c. 1978.

DISEASES
UNIT V

ANSWERS TO TEST

1. a. The period between the exposure to the disease agent and the appearance of the first symptoms or signs of the disease
   b. The entry and development of a pathogen in or on the body of an animal
   c. Any departure from a state of health
   d. Any observable sign or evidence of disease
   e. The expulsion of a dead or immature fetus

2. a. 5
   b. 7
   c. 6
   d. 4
   e. 2
   f. 1
   g. 3

3. a. G
   b. Rp
   c. C
   d. R
   e. G
   f. Rp
   g. G
   h. R

4. Any three of the following:
   a. Testing of all cows and heifers
   b. Removal of reactors from the herd
   c. Calfhood vaccination of all replacement heifers
   d. Retesting at regular intervals

   e. Isolation of all new animals purchased

   f. Testing of new animals before placing in herd

5. a. Quarantine

   b. Isolate

   c. Destroy and render

6.

DISEASE	SPECIES AFFECTED	SYMPTOMS	TREATMENT AND CONTROL
Brucellosis	Cattle, sheep, swine, and men	Abortion; retained placenta; repeat breeders	Slaughter infected animals; calfhood vaccinate
Cholera	Swine	Sudden onset of fever; loss of appetite; weakness; belly may be purplish	Quarantine; isolate destroy and render
Anaplasmosis	Cattle and sheep	Weakness; lagging behind herd; skin becomes pale around eyes, muzzle, lips, and teats, then turns yellow	Vaccinate all animals; keep animals from brushy areas; control flies, ticks, and mosquitoes
Pneumonia	Cattle, sheep, and swine	High fever; quick shallow breathing; loss of appetite; cackling noise with breathing; discharge from nostrils	Isolate sick animals; practice good sound husbandry; use sulfa drugs and antibiotics
Erysipelas	Swine	Purple patches under belly; knees and hocks swollen and stiff	Isolate all sick animals; clean and disinfect pens; vaccinate once or twice a year

Pinkeye	Cattle and sheep	Watering and squinting of eyelids; severe reddening of the membrane	Isolate affected animals; use of antibiotics helps in control

7. Any two of the following:
   a. Purchase of infected animals
   b. Contact with other infected cattle
   c. Exposure at livestock shows
   d. Livestock trucks and trailers
   e. Public livestock auctions
   f. Aborted calves not disposed of properly

8. Any three of the following:
   a. Feed contaminated with urine
   b. Mouth and nose secretions
   c. Drinking unclean water
   d. Garbage feeding

PARASITES
UNIT VI

SUGGESTED ACTIVITIES

I. Instructor
   - A. Provide students with objective sheet
   - B. Provide students with information sheet
   - C. Make transparencies
   - D. Discuss terminal and specific objectives with students
   - E. Give test

II. Students
   - A. Read objective sheet
   - B. Study information sheet
   - C. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objectives
   - B. Information sheet
   - C. Transparency masters

     TM 1--External Parasites
     TM 2--Life Cycle of the Cattle Grub
     TM 3--Life Cycle of the Swine Intestinal Roundworm
     TM 4--Life Cycle of the Horn Fly
   - D. Test
   - E. Answers to test

II. References:
   - A. Beef Cattle Production, Kenneth A. Wagnon, Reuben Albaugh, George H. Hart, The MacMillan Company, New York, New York.

B. Swine Production, Clarence E. Bundy, Ronald V. Diggins, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

C. The Stockman's Handbook, M.E. Ensminger, The Interstate Printers and Publishers, Inc., Danville, Illinois.

D. Working in Animal Science, Paul Peterson, Allen C. Christenson, and Edward A. Nelson, McGraw Hill Inc., 1978.

PARASITES
UNIT VI

ANSWERS TO TEST

1. a. Parasite - An organism that lives on and gets its food from some other plant or animal

   b. Coccidiosis - A parasite disease caused by protozona organisms known as coccida

   c. Tick - A blood-feeding parasite known to transmit some disease-bearing organisms

   d. External parasite - One that lives on or under the skin

   e. Internal parasite - One that lives within the organs of the body

2. A. Any five of the following:
   1. Practice pasture rotation
   2. Check animals regularly
   3. Treat animals showing signs of parasites
   4. Practice good lot sanitation
   5. Drain wet pasture sites
   6. Graze young animals on clean pasture

   B. Any five of the following:
   1. Keep manure cleaned from barnyards to prevent fly breeding
   2. Spray livestock frequently
   3. Spray livestock housing
   4. Control grubs before they damage the hide
   5. Spray new animals arriving on farm
   6. Check livestock frequently

3. a. E
   b. I
   c. E
   d. E
   e. I
   f. I
   g. E
   h. E
   i. I
   j. E

4. a. Lice
   b. Mite
   c. Screwworm fly
   d. Tick
   e. Heel fly
   f. Horn fly
   g. Barn fly

5. a. Adult lays eggs
   b. Larva enters body
   c. Larva drops to ground
   d. Emerges as adult

6. Instructor should grade according to Transparency 3.

7. a. Adult
   b. Egg
   c. Larva

8.

Parasite	Species Affected	Symptoms	Preventions and Controls
Tick	Cattle, sheep, and swine	Weak, loss of weight, ears droop	Spray and dust frequently
Lungworm	Cattle, sheep, and swine	Coughing, labored breathing, loss of appetite	Good sanitation. Prevent spreading infested manure on pasture.
Heel Fly	Cattle	Swelling in back of animals	Control flies between June and October
Horse Fly	Cattle and horses	Irritation, restlessness, loss of condition, causes anaplasmosis in cattle	No spray available

DAIRY PRODUCTS
UNIT VII

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide students with objective sheets.
  B. Provide students with information and assignment sheets.
  C. Discuss terminal and specific objectives
  D. Discuss information and assignment sheets.
  E. Give quiz.
  F. Provide a sample test on milk production and milk marketing as used in a Dairy Products Judging Contest.

II. Students:

  A. Read objectives
  B. Study information sheets.
  C. Complete assignment sheets.
  D. Take quiz.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objectives
  B. Information sheets
  C. Transparency Masters
    TM 1 - Milk Flavor Scoring Guide
    TM 2 - Cottage Cheese Flavor Scoring Guide
  D. Assignment sheets
    #1 - Milk Quality and Dairy Foods Contest
    #2 - Milk Quality and Dairy Foods Contest
  E. Quiz
  F. Answers to quiz

II. References:

  A. Judging Dairy Products, J.A. Nelson and Malcom Trout, Fourth Edition, Olsen Publishing Co., Milwaukee, Wis.

B. Judging Quality in Dairy Products, Circular 54, Ag Extension Station, University of Nebraska, College of Agriculture, Lincoln, Nebraska, PP. 3-14, (Revised 1948).

C. "Judging and Scoring Milk and Cheese", Farmer's Bulletin No. 2259, USDA. Obtain from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., (15c).

D. "Cheese Varieties", USDA Agriculture Handbook, No. 54, 1969 (65¢).

E. "Cheese in Family Meals", USDA Home and Garden Bulletin, No. 112.

F. "Cheese Buying Guide for Consumers", USDA Marketing Bulletin, No. 17, (10¢).

G. "Newer Knowledge of Cheese", 2nd Edition, "Cheese", 1968.

H. "UDSA Sediment Standards for Milk and Milk Products", #7 CFR 58 Subpart T.

I. "Questions and Answers on Federal Milk Marketing Orders", U.S. Department of Agriculture, Agricultural Marketing Service, Bulletin 94. Latest edition, Washington, D.C., 20250.

J. "The Science of Providing Milk For Man", by John R. Campbell and Robert T. Marshall. McGraw-Hill Publishing Company, 1221 Avenue of the Americas, New York, N.Y. 10020, 1975.

K. "Milk Quality and Dairy Foods Contest" a set of 85 slides with cassette tape and written manuscript. Available for $25 from Instructional Material Laboratory, 8 Industrial Education, University of Missouri, Columbia, Missouri 65201.

L. Grade A Pasteurized Milk Ordinace, 1978 Recommendations of the U.S. Public Health Service, U.S. Department of Health, Education, and Welfare, Public Health Service.

DAIRY PRODUCTS
UNIT VII

ANSWERS TO TEST

1. a. Undesirable factors (Rubber) -
    1. Dirty or milkstone inside
    2. Checked or blistered
    3. Absorbed fat
    4. Leaky
    5. Poorly fitted

   b. Undesirable factors (Metal) -
    1. Dirty or milkstone inside
    2. Badly dented or damaged
    3. Pitted or corroded
    4. Open seam
    5. Exposed copper or brass

2. The answer should include the following:

   a. The sediment disc represents the sediment on one pint of milk taken from a well mixed sample and run through a sediment tester fitted with an orifice measuring 0.40 inches in diameter.

   b. Score sediment discs as follows:

0 mg sediment	10
More than 0 mg, but not more than .5 mg	5
More than .5 mg, but not more than 1.5 mg	3
More than 1.5 mg, but not more than 2.5 mg	1
More than 2.5 mg	0

3. a. Feed-bacteria count may be low; flavor present when milk is drawn; usually more intense in nights milk; usually present when cows have had access to roughage shortly before milking

   b. Absorption
    1. Direct - Encountered very rarely; results only after long exposure to very odoriferous atmosphere

  2. Indirect - Bacteria count may be low; odor of milk suggests uncleanliness

c. Chemical Composition of milk - Composition of milk flavor defects is noticeable when the milk is first drawn, milk usually distinctly salty; inherent to individual animal rarely in mixed milk; defect more likely from animal advanced in lactation or with infected udder

d. Processing - Pasteurized "heated or modified cooked" flavor. Detectable immediately after processing; usually not very intense; tends to disappear during storage

e. Chemical - Not present when milk is first drawn or immediately after pasteurization; develops readily at low temperatures - below 40° F bacteria count low

  1. Rancidity - In raw milk only; bitter, soapy flavor; defect more in cream than in milk and more intense in butter than in cream

  2. Oxidized - Chiefly in pasteurized milk; papery; tallowy; odor somewhat like wet cardboard

  3. Activated - In pasteurized milk exposed to light, suggest burn protein

f. Foreign Material - Defect present in freshly bottled milk; taints vary; may resemble brine, medicine, paint, fly spray, or any other strong substance with which the milk may have been contaminated

4. a. Bitter
   b. Feed
   c. Flat/Watery
   d. Foreign
   e. Garlic/Onion
   f. High Acid
   g. Malty
   h. Metallic/Oxidized
   i. Musty
   j. Rancid
   k. Salty
   l. Unclean
   m. Weedy

5. a. Acid
   b. Bitter
   c. Coarse
   d. Fermented/Fruity
   e. Flat
   f. Foreign
   g. Garlic/Onion
   h. Lacks Freshness
   i. Malty
   j. Metallic/Oxidized
   k. Musty/Yeasty
   l. Rancid
   m. Salty
   n. Unclean

6. Discuss should include the following:
    a. Fresh, clean, pleasant, delicate-acid flavor that cleans up well after it has been eliminated from the mouth
    b. Determined by the characteristic flavor of the curd, the acidity of the curd, the volatile products formed by growth of the lactic acid organisms

7. a. Made from sweet, pasteurized skim milk, concentrated skim milk, non-fat dry milk solids or mixtures of regular and reconstituted skim
    b. Acid development is accomplished by the use of lactic starter or direct acid set
    c. Rennet is permitted at the option of the manufacturer
    d. The moisture content of the finished curd must not be more than 8%
    e. 4% milk fat for creamed cottage cheese

8. The answers will correspond to the samples that the instructor shows.

WHOLESALE CUTS AND QUALITY GRADES OF BEEF, PORK, AND LAMB
UNIT VIII

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheet.
   - B. Provide students with information sheets.
   - C. Make transparencies.
   - D. Discuss terminal and specific objectives.
   - E. Discuss information sheets.
   - F. Plan a field trip to a slaughter plant or wholesale meat plant.
   - G. Give test.

II. Students:
   - A. Read objective sheet.
   - B. Study information sheet.
   - C. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objectives
   - B. Information sheets
   - C. Transparency masters
     1. TM 1 - Wholesale Cuts of Beef
     2. TM 2 - Degrees of Marbling
     3. TM 3 - Quality Grades of Beef
     4. TM 4 - Wholesale Cuts of Pork
     5. TM 5 - Wholesale Cuts of Lamb

II. References:
   - A. Animal Science and Industry Laboratory Manual, Able, Allen, Hines, McKee, Kansas State University, Manhattan, Kansas, 1973.
   - B. The Meat We Eat, Ziegler, Thomas P., The Interstate Printers and Publishers, Danville, Illinois, 1962.

C. *Cuts of Meat - How You Can Identify Them*, Swift and Company, Agriculture Research Department, Chicago, Illinois.

D. *Meat Evaluation Handbook*, National Livestock and Meat Board, Chicago, Illinois, 1969.

E. Peterson, Paul, Allen C. Christenson, and Edward A. Nelson., *Working In Animal Science*, McGraw Hill, Inc., c. 1978.

WHOLESALE CUTS AND QUALITY GRADES OF BEEF, PORK, AND LAMB
UNIT VIII

ANSWERS TO TEST

1. a. Wholesale cuts - the parts at which the carcass is separated for selling purpose

   b. Marbling - flecks of intramuscular fat throughout the lean which denotes tenderness

   c. Grade - measure of a carcass degree of excellence based on conformation, finish, and quality

   d. Finish - refers to the amount, quality, and distribution of fat

   e. Quality - refers to the eating quality of the meat as indicated by characteristics of the fat and lean tissue, bone and marbling

   f. Feathering - the internal fat deposited between the ribs on the internal carcass. An abundance of feathering indicates an abundance of marbling

   g. Cutability - the proportion of the carcass that is saleable as trimmed retail cuts.

2. a. Rump

   b. Round

   c. Hind shank

   d. Loin

   e. Flank

   f. Ribs

   g. Plate

   h. Chuck

   i. Shank

   j. Brisket

3. a. 3 Traces

   b. 6 Slight

   c. 2 Small

   d. 5 Modest

   e. 7 Moderate

   f. 1 Slightly abundant

g. 4 Moderately abundant
h. 8 Abundant
i. 9 Practically devoid

4. a. Prime
   b. Choice
   c. Good
   d. Standard
   e. Utility
   f. Commercial
   g. Cutter
   h. Canner

5. a. Good
   b. Commercial
   c. Cutter

6. a. Carcass weight
   b. Rib eye area
   c. Internal fat percentage (kidney, pelvic, and heart fat)
   d. External fat over rib eye

7. a. 3
   b. 5
   c. 1
   d. 4
   e. 2

8. a. Jowl
   b. Boston butt
   c. Picnic
   d. Loin
   e. Side
   f. Ham

9. a. U.S. No. 1
   b. U.S. No. 2
   c. U.S. No. 3
   d. U.S. No. 4
   e. Utility

10. a. Leg
    b. Sirloin
    c. Flank
    d. Loin
    e. Rack
    f. Square cut
    g. Breast

11. a. Prime
    b. Choice
    c. Good
    d. Utility

12. a. Beef 55 %
    b. Pork 72-75%
    c. Lamb 45-48%

BLUEPRINT READING
UNIT I

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide students with objective sheet

  B. Provide each student with information and assignment sheets

  C. Make transparencies

  D. Discuss terminal and specific objectives

  E. Discuss information and assignment sheets

  F. Give test

II. Student

  A. Read objectives

  B. Study information sheet

  C. Obtain drawing paper, ruler, and tri-square protractor to be used in drawing plans

  D. Complete assignment sheet

  E. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

  A. Objectives

  B. Information sheet

  C. Transparency masters

    TM 1--Converting a Pictorial View into a Three-Sided View
    TM 2--Types of Dimensions on a Blueprint
    TM 3--Basic Lines Used in Blueprint Reading
    TM 4--Use of Lines on a Blueprint Reading

  D. Assignment sheet #1--Drawing a Three-View Sketch

  E. Test

  F. Answers to test

II. References

A. Bennett, A.E., and Louis J. Siy, Blueprint Reading for Welders, Delmar Publishers, Inc.

B. Sacks, Raymond, Theory and Practice of Arc Welding, Van Nostrand Reinhold Company. OK000498

C. How To Read Shop Drawings, The Lincoln Electric Company, Cleveland, Ohio. OK000620

D. Shinn, Glen C. and Curtis R. Weston, Working in Agricultural Mechanics, McGraw Hill Inc., c. 1978.

BLUEPRINT READING
UNIT I

ANSWERS TO TEST

1. To convey a message from the draftsman to the workman indicating shapes and dimensions of objects to be built.

2. a. Top
   b. Front
   C. End

3. To be evaluated by the instructor.

4. a. Lines
   b. Dimensions
   c. Notes

5. a. 2
   b. 3
   c. 1

6. a. Hidden
   b. Center
   c. Dimension
   d. Extension
   e. Object
   f. Border

7. a. Border line
   b. Object line
   c. Extension line
   d. Dimension line
   e. Leader line
   f. Hidden line
   g. Center line

8. a. Location dimension

b. Overall dimension

c. Size dimension

9. a. 11

b. 16

c. 17

d. 19

e. 13

f. 18

g. 6

h. 5

i. 15

j. 3

k. 14

l. 9

m. 1

n. 10

o. 12

POSITION WELDING
UNIT II

SUGGESTED ACTIVITIES

I. Instructor
   A. Provide students with objective sheets
   B. Provide students with information and job sheets
   C. Make transparency
   D. Discuss terminal and specific objectives
   E. Discuss information sheets
   F. Demonstrate and discuss procedures outlined in the job sheets
   G. Give test
   H. Develop a job sheet for a small individual project that will utilize the skills required in the objective, could be graded and taken home by the student

II. Students
   A. Read objective sheets
   B. Study information sheets
   C. Demonstrate the ability to accomplish the procedures outlined in the job sheets
   D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit;
   A. Information sheet
   B. Transparency master
      TM 1-Properly and Improperly Formed Beads
   C. Job Sheets
      #1-Making a Pad in the Flat Position
      #2-Making a Pad in the Horizontal Position
      #3-Making a V-butt Weld
      #4-Running a Continuous Bead
      #5-Running Vertical up Butt Welds
      #6-Running Vertical down Butt Welds
      #7-Running Vertical down Fillet Welds
      #8-Running Vertical down Fillet Welds
      #9-Running Overhead Butt and Fillet Welds

II. References

A. Althouse, Turnquist, Bowditch, Modern Welding, Homewood, Illinois: The Goodheart-Willcox Company, Inc.

B. Giachino, Weeks, Burne, Welding Skills and Practices, Third Edition, Chicago, Illinois, American Technical Society.

C. The Welding Encyclopedia, The Welding Engineer Publishing Company, Division of the McGraw-Hill Publishing Company, Inc.

POSITION WELDING
UNIT II

ANSWERS TO TEST

1. a. 4
   b. 6
   c. 2
   d. 3
   e. 1
   f. 7
   g. 5
   h. 10
   i. 9
   j. 8

2. Any four of the following:
   a. Length of welding cables
   b. Thickness of base metal
   c. Diameter of electrode
   d. Welding technique used by operator
   e. Efficiency of welding machine and polarity
   f. Size of fillet weld
   g. Welding position

3. a. Permits better fusion of beads
   b. Prevents gas pockets from forming in bead
   c. Improves appearance of bead

4. a. Increases strength of weld
   b. Improves appearance of bead
   c. Improves penetration

5. a. Amperage
   b. Length of arc
   c. Speed of travel
   d. Position of electrode

6. a. Current too high
    b. Current too low
    c. Speed too fast
    d. Current, voltage, and speed normal
    e. Voltage too low
    f. Voltage too high
    g. Speed too slow

7. Performance test will be given on the following
    a. Starting, stopping, and restarting a bead
    b. Constructing a pad in the flat, horizontal, and vertical (up) positions
    c. Making a V-butt weld
    d. Running a continuous bead

8. 2 a.
    4 b.

    c. 1) Wear long sleeved shirt
        2) Wear welders gloves
        3) Button collar shirt
        4) Turn cuffs down
        5) Wear boots or high topped shoes

    d. 1) Check poser lead for bare conductors
        2) Check welding leads for bare conductors
        3) Check electrode holder for proper insulation

OXYACETYLENE FUSION WELDING
UNIT III

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet.
- B. Provide students with information and job sheets.
- C. Make transparencies.
- D. Discuss terminal and specific objectives.
- E. Discuss information sheets.
- F. Demonstrate and discuss procedures outlined in the job sheets.
- G. Give test.
- H. Develop a project job sheet incorporating the required gas welding skills into a small take home project. This would be used as a graded project.

II. Students:

- A. Read objectives.
- B. Study information sheets.
- C. Demonstrate the ability to accomplish the procedures outlined in the job sheets.
- D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Objectives
- B. Information sheets
- C. Transparency masters
    1. TM 1 - Oxyacetylene Welding Flames
    2. TM 2 - Laying Bead with Filler Rod
    3. TM 3 - Laying Bead without Filler Rod
- D. Job sheets
    1. Job Sheet #1 - Turning On, Lighting, Adjusting Flames, and Turning Off the Torch for Fusion Welding
    2. Job Sheet #2 - Making a Corner Weld without Filler Rod
    3. Job Sheet #3 - Laying Beads on Flat Plate without Filler Rod
    4. Job Sheet #4 - Laying Beads on Flat Plate with Filler Rod

5. Job Sheet #5 - Welding Butt Joints with Filler Rod

E. Test

F. Answers to test

II. References:

A. Smith's Instructor's Manual for a Basic Course in Oxyacetylene Brazing, Cutting, and Welding (Form 424), Smith Welding Equipment, Division of Tescom Corporation, Minneapolis, Minnesota.

B. Instructor's Answer Key (Form 429). For use with Smith's Instructor's Manual (Form 424), Smith Welding Equipment, Division of Tescom Corporation, Minneapolis, Minnesota.

C. Farm Mechanics Text and Handbook, Lloyd J. Phipps, H.F. McColly, L.L. Scranton, G.C. Cook, The Interstate Printers and Publishers, Inc., Danville, Illinois.

D. Althouse, Andrew D., Carl H. Turnquist, and William A. Bowditch, Modern Welding, The Goodheart-Willcox Company, Inc., Homewood, Illinois.

E. The Oxyacetylene Handbook: A Manual on Oxyacetylene Welding and Cutting Procedures, Union Carbide Corporation, Linde Division, 270 Park Avenue, New York, New York 10017.

F. Shinn, Glen C. and Curtis R. Weston, Working in Agricultural Mechanics, McGraw Hill, Inc., c. 1978.

OXYACETYLENE FUSION WELDING
UNIT III

ANSWERS TO TEST

1. a. Inner cone - The inner white part of the neutral flame
   b. Penetration - The distance from the original surface of the base metal to that point at which fusion ceases
   c. Backfire - A momentary burning back of the flame into the tip, flame goes out with a loud snap or pop
   d. Fusion welding - The joining of pieces of metal by heating the adjoining edges to the fusion or melting point and allowing them to flow or run together and then cool
   e. Tack weld - A short weld used for temporarily holding material in place

2. a. Proper flame adjustment
   b. Angle of tip
   c. Distance from work
   d. Speed of travel
   e. Movement of tip

3. a. Consistent width
   b. Straightness
   c. Slightly crowned
   d. Fused into base metal

4. a. Metal thickness
   b. Size of welding rod

5. a. Rod with similar properties as base metal
   b. Thickness of metal

6. Add strength to weld or joint

7. a. Neutral
   b. Oxidizing
   c. Carburizing

OXYACETYLENE BRAZING
UNIT IV

SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide students with objective sheet.
- B. Provide students with information sheets.
- C. Make transparency.
- D. Discuss terminal and specific objectives with students.
- E. Discuss information sheets.
- F. Demonstrate the correct procedure of braze welding.
- G. Give test.
- H. Develop a project job sheet incorporating the required brazing skills into a small take home project. This would be used as a graded project.

II. Students:

- A. Read objective sheet.
- B. Study information sheets.
- C. Demonstrate the proper procedure of braze welding.
- D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

- A. Information sheets
- B. Transparency master
  - 1. TM 1 - Brazing a Butt Joint
- C. Job sheet
  - 1. Job Sheet #1 - Brazing a Butt Joint
- D. Test
- E. Answers to test

II. References:

- A. The Oxy-Acetylene Handbook: A Manual on Oxy-Acetylene Welding and Cutting Procedures, Union Carbide Corporation, Linde Division, New York, New York, 1960.

B. *Modern Welding*, Andrew D. Althouse, Carl H. Turnquist, and William A. Bowditch,Goodheart-Willcox Company, Homewood, Illinois, 1965.

C. *Welding Skills and Practices*, J.W. Giachino, William Weeks, and Elmer Brune, American Technical Society, Chicago, Illinois, 1967.

D. Shinn, Glen C. and Curtis R. Weston, *Working in Agricultural Mechanics*, McGraw Hill Inc., c. 1978.

OXYACETYLENE BRAZING
UNIT IV

ANSWERS TO TEST

1. a. Flux - A chemical used to clean metal during the welding process

   b. Ductile - A term describing metal which is capable of being drawn or stretched out

   c. Malleability - A property of metals which allows them to be bent or permanently distorted without rupture

   d. Brazing - The uniting of two pieces of metal together to form one piece by the use of a bronze rod and flux

   e. Tinning operation - The melting of a small amount of bronze rod onto the surface and allowing it to spread along the entire seam

2. In brazing, the base metal is not melted, while in fusion welding, the base metal is melted. Also, a bronze rod and flux are necessary for brazing.

3. Any three of the following:

   a. Main characteristics of base metal not destroyed

   b. Less gas consumed

   c. Can be used on thin metals

   d. Used on malleable castings

   e. May be used in joining different kinds of metals

4. a. Cannot be used on metal where stress is a factor

   b. Expensive to use

5. a. Bronze will stick easier

   b. Allows bronze to flow smoothly and evenly over entire weld area

6. By use of flux

7. Any five of the following:

   a. Chemically cleans the base metal

   b. Prevents oxidation of the filler rod

   c. Removes oxides from metal

d. Increases flow of filler rod

e. Brings filler metal into immediate contact with the metals being joined

f. Permits filler metal to penetrate the pores of the base metal

FIGURING BILLS OF MATERIALS
UNIT V

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide students with objective sheet.

  B. Provide students with information and assignment sheets.

  C. Discuss terminal and specific objectives.

  D. Discuss information and assignment sheets

  E. Give test.

II. Students:

  A. Read objectives.

  B. Study information sheets and complete assignment sheet.

  C. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objectives

  B. Information sheets

  C. Assignment sheets

    #1 - Calculating Board Feet

    #2 - Calculating Cost of Steel

  D. Answers to assignment sheet

  E. Test

  F. Answers to test

II. References:

  A. Shopwork on the Farm, Mack M. Jones, McGraw-Hill Book Company, New York, New York, 1955.

  B. Farm Mechanics Text and Handbook, Lloyd J. Phipps, H.F. McColly, L.L. Scranton, and G.C. Cook, Interstate Publishers and Printers, Danville, Illinois.

  C. Shinn, Glen C. and Curtis R. Weston, Working in Agricultural Mechanics, McGraw Hill, Inc. c. 1978

FIGURING BILLS OF MATERIALS
UNIT V

ANSWERS TO ASSIGNMENT SHEET #1

1. 8.3 board feet
2. 4.6 " "
3. 8 " "
4. 13.3 " "
5. 10.6 " "
6. 26.5 " "
7. 200 " "
8. 12 " "
9. 1,400 " "
10. 3 " "

ANSWERS TO ASSIGNMENT SHEET #2

1. $76.80
2. $102.00
3. $476.63
4. $62.22
5. $19.78

FIGURING BILLS OF MATERIALS
UNIT V

ANSWERS TO TEST

1. a. Board foot - A piece of lumber one inch thick, 12 inches wide, and 12 inches long

   b. Running foot - The foot length of lumber regardless of the thickness and the width

   c. Bill of material - An itemized list of the number of places needed and the dimensions of each

   d. Surfaced lumber - The lumber that has been dressed by running through a planer

2. Board foot, priced on the basis of 1,000 board feet

3.

Width	Length
a. 4"	a. 6'
b. 6"	b. 8'
c. 8"	c. 10'
d. 10"	d. 12'
e. 12"	e. 14'

4. a. Square foot

   b. Weight converted to feet

5. $$\frac{\text{No. of pieces} \times \text{Thickness} \times \text{Width} \times \text{Length}}{12} = \text{Board Feet}$$

6. a. Easy understanding

   b. Number of pieces

   c. Kind of material

   d. Dimension

   e. Finish

   f. Amount

   g. Calulation of cost per piece

7. a. 3

   b. 1

   c. 4

   d. 2

   e. 5

8. Board feet x cost per 1,000 = cost of lumber

9. a. Number of pieces x $\frac{\text{Length in feet}}{100}$ x Price/CFT = Value or cost

   b. $\dfrac{\text{Amount in number of units} \times \text{Weight in pounds/unit}}{100} \times$ Price/CWT = Value or cost

10. a. 24 board feet
    b. 3.3 board feet
    c. 500 board feet
    d. 80 board feet

INTRODUCTION TO PLUMBING
UNIT VI

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide students with objective sheet

  B. Provide students with information and job sheets

  C. Make transparencies

  D. Discuss terminal and specific objectives

  E. Discuss information sheet

  F. Demonstrate and discuss procedures outlined in the job sheets

  G. Give test

II. Students

  A. Read objective sheet

  B. Study information sheet

  C. Demonstrate the ability to accomplish the procedures outlined in the job sheets

  D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objectives

  B. Information sheet

  C. Transparency masters

    TM 1--Pipe Fittings
    TM 2--Plumbing Tools
    TM 3--Types of Valves
    TM 4--Measuring for Pipe Length

  D. Assignment sheet #1--Determining Pipe and Thread Length

  E. Answers to assignment sheet

  F. Job sheets

    #1--Cutting Pipe
    #2--Reaming Pipe
    #3--Threading Pipe

  G. Test

H. Answers to test

II. References:

A. Farm Mechanics Text and Handbook, Lloyd J. Phipps, H.F. McColly, L.L. Scranton, and G.C. Cook, Interstate Printers and Publishers, Danville, Illinois.

B. Shopwork on the Farm, M.M. Jones, McGraw-Hill Book Company, New York, New York.

C. General Shop Guide for Vo-Ag Students, State of Alabama, State Department of Education, Vocational Division, Agricultural Education Service, Montgomery, Alabama.

D. The Farm Shop, Wakeman & McCoy, MacMillan Co., New York, New York.

E. Shinn, Glen C. and Curtis R. Weston, Working in Agricultural Mechanics. McGraw Hill Inc., c. 1978.

INTRODUCTION TO PLUMBING
UNIT VI

ANSWERS TO ASSIGNMENT SHEET #1

1. Face to face length = 24"

   Length inside A & B - A = 5/8", B = 5/8", Total = 1 1/4"

   Total length = 25 1/4"

   Thread length = 1 1/16"

2. Center to center distance = 60"

   Center to face of elbow = 1 1/2"

   Center to face of straight tee = 1 1/2"

   Total = 3"

   Face to face length = 57"

   Inside fitting length = 9/16" X 2" = 1 1/8"

   Total length needed = 58 1/8"

   Thread length = 1 1/32"

INTRODUCTION TO PLUMBING
UNIT VI

ANSWERS TO TEST

1. a. Trap - A water-sealed bend or chamber in a waste pipe
   - b. House drain - A pipe which carries all the sewage from the house
   - c. Plumbing - The piping and pipe attachments used to carry water into buildings and to drain away sewage and waste
   - d. Soil pipes - Large pipes used to carry sewage
   - e. Fittings - Pieces used to join pipe, to provide openings in pipes, and to change the direction of pipes

2. Any five of the following:
   - a. Black - Used for natural and L.P. gas, oil, and air lines
   - b. Galvanized - Used for water lines
   - c. Copper tubing - Used in water, refrigeration, and waste systems
   - d. Cast iron - Used in sewage systems
   - e. Brass or lead - Used in traps and drains
   - f. Plastic - Used in water systems
   - g. PVC - Used in a water or sewage system (plastic pipe)
   - h. Soil - Used in a sewage system (cast iron pipe)

3. a. Insures tight joints
   - b. Prevents threads from rusting

4. a. Cuts easier
   - b. Cuts smoother
   - c. Lasts longer
   - d. Removes burrs from dies

5. a. Bench vise
    b. Ratchet pipe reamer
    c. Pipe cutter
    d. Ratchet threaders
    e. 3-way pipe threader

6. a. Coupling
    b. Cross
    c. Cap
    d. 45° Elbow
    e. Bushing
    f. Tee
    g. Union
    h. Plug
    i. Street elbow
    j. Nipple

7. a. 1/4"
    b. 1/2"
    c. 3/4"
    d. 1"
    e. 1 1/4"

8. Pipe threads are tapered 1/16" per inch; bolt threads are straight

9. Outside diameter

10. Inside diameter

CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE
UNIT VII

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheet.
   - B. Provide students with information sheets.
   - C. Make transparencies.
   - D. Discuss terminal and specific objectives.
   - E. Discuss information sheets.
   - F. Additional exercise - build forms for a sidewalk.
   - G. Give test.

II. Students:
   - A. Read objectives.
   - B. Study information sheets.
   - C. Participate in building forms for sidewalk if job is available.
   - D. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objectives
   - B. Information sheets
   - C. Transparency masters
     - 1. TM 1 - Materials for Constructing Concrete Forms
     - 2. TM 2 - Materials for Reinforcing Concrete
   - D. Test
   - E. Answers to test

II. References:
   - A. "Making Quality Concrete for Farm Construction," #PA055T, Portland Cement Association, Old Orchard Rd., Skokie, Illinois. 60076.
   - B. Phipps, Lloyd J., H.F. McColly, and L.L. Scranton, Farm Mechanics Text and Handbook, The Interstate Printers and Publishers, Inc., Danville, Illinois, 1967.

CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE
UNIT VII

ANSWERS TO TEST

1. a. Forms - the materials that are built into the desired shape to hold the concrete, when poured, in place

   b. Reinforcing materials - steel bars or mesh placed in concrete to increase its tensile strength

2. Forms hold the concrete in the shape desired until it sets or hardens enough to stand by itself.

3. Any of the following:
   - a. Must be true to size and shape.
   - b. Should be rigidly braced to prevent bulging, sagging, and spreading
   - c. Should be tight and free from openings to prevent leaking
   - d. Should be easy to remove after concrete has set

4. Any of the following:
   - a. Plywood and other manufactured products with a smooth finish
   - b. Dimension lumber for form studs, braces, stakes, and spacers
   - c. Wire
   - d. Nails

5. Discussion should include these points:
   - a. Nails and wood bracing
   - b. Wire ties and wood spacers
   - c. Removal of wire ties and wood spacers

6. Discussion should include these points:
   - a. In warm weather, forms should remain in place two or three days.
   - b. In cold weather, allow forms to remain twice as long
   - c. In no case should the forms be removed until the concrete has thoroughly set and there is no danger of damaging, without recovering with plastic

- d. Forms left in place for at least a week aid the curing process by protecting the concrete from drying too rapidly.
- e. The weather, temperature, and nature of the work determine the length of time to leave forms in place.
- f. When reusing forms, clean them as they are removed

7. Reinforcement is for the purpose of increasing the strength of concrete

8. Any of the following:
   - a. Steel rod
   - b. Wire mesh
   - c. Larger sizes of the above

9. Any of the following:
   - a. Use only clean steel (free from rust, paint, and scale)
   - b. Place steel no closer than 3/4 inches from the outside surface
   - c. Lap all bars 48 times their diameter (1/2 inch bars should be lapped 24 inches and then wired together)
   - d. Place reinforcement where concrete will be in tension (such as corners, joints, etc.)

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheet.
   - B. Provide students with information and job sheets.
   - C. Make transparencies.
   - D. Discuss terminal and specific objectives.
   - E. Discuss information sheet.
   - F. Provide students with assignment sheets.
   - G. Give test.
   - H. Tour ready-mix plant, mix concrete.

II. Student:
   - A. Read objectives.
   - B. Study information sheet.
   - C. Complete the assignment sheets.
   - D. Take test.
   - E. Tour plant and mix concrete if time allows.
   - F. Make trial mix of concrete.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objective sheet
   - B. Information sheet
   - C. Transparency masters
     1. TM 1 - Volume of materials in Concrete
     2. TM 2 - Moisture in Sand
     3. TM 3 - Recommended Mixtures Fullers Rule
   - D. Assignment sheets
     1. Assignment Sheet #1 - Applying Fullers Rule
     2. Assignment Sheet #2 - Determining cubic yards
   - E. Answers to Assignment sheets
   - F. Test
   - G. Answers to test

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

A. $\frac{100 \times 6 \times 4}{12}$ = 200 cubic feet of concrete

B. $\frac{200 \times 42}{27}$ = 311 cubic feet of raw materials

C. $1 + 2\ 1/4 + 3$ = 6 1/4 parts

D. $\frac{311}{6.25}$ = 49.9 or 50 sacks

E. $\frac{50 \times 2.25}{27} = \frac{112.5}{27}$ = 4.17 cubic yards

F. $\frac{50 \times 3.0}{27} = \frac{150}{27}$ = 5.56 cubic yards

Assignment Sheet #2

A. Length 200' Width 20'

B. Depth 4"

C. $\frac{200 \times 20 \times 4''}{12}$ = 1,333.33 cubic feet

D. $\frac{1333.34}{27}$ = 49.38 cubic yards or 49 1/2 yards

MATERIALS FOR QUALITY CONCRETE
UNIT VIII

ANSWERS TO TEST

1. a. 6
   b. 2
   c. 4
   d. 3
   e. 5
   f. 1

2. Any six of the following:
   a. Fence posts
   b. Water troughs
   c. Walks
   d. Drive-ways
   e. Floors
   f. Feeding troughs
   g. Walls and foundations
   h. Septic tanks
   i. Feeding floors
   j. Culverts
   k. Manure pits
   l. Silos
   m. Steps
   n. Setting posts
   o. Cattle guards

3. Any five of the following:
   a. Fireproof
   b. Durable and permanent
   c. Water tight
   d. Economical
   e. Termite and rodent proof
   f. Low maintenance
   g. Storm resistant

h. Readily adapted

4. a. 1
   b. 2
   c. 5
   d. 4
   e. 3

5. a. Water
   b. Sand (fine aggregate)
   c. Gravel (coarse aggregate)
   d. Water

6. Cement - 10%
   Water - 15%
   Sand and gravel - 75%

7. a. Parts of cement
   b. Parts of sand
   c. Parts of gravel

8. a. Water-cement ratio

9. a. 2
   b. 3
   c. 4

10. Controlled by addition or subtraction of aggregate.

11. Mixing a total of 42 volumes of cement, sand , and gravel produces 27 volumes of concrete.

12. a. 4
    b. 3
    c. 1
    d. 2
    e. 5
    f. 6

    a. 6
    b. 1
    c. 7
    d. 4
    e. 2
    f. 3
    g. 5

13. Advantages (any three)
    a. Convenient
    b. Less hired labor
    c. Quicker
    d. Assured of good quality
    e. May be more economical

    Disadvantages (any three)
    a. Cost may be high
    b. Forms must be strong
    c. Not always available
    d. Sometimes large areas ready to finish at same time

14. Ready-mix (ordering)
    a. Establish water-cement ratio for job.
    b. Establish bags of cement per yard of cement.
    c. Determine amount of concrete needed.
    d. Determine type of mix.
    e. Call early and list (1-4), time of delivery, and directions to job site.
    f. Reconfirm order on day of delivery.

    Ready-mix (preparing for)
    a. Wet forms and subgrade 4-6 hours before pouring concrete.
    b. Have forms well braced.
    c. Have equipment ready.

PLACING, FINISHING, AND CURING CONCRETE
UNIT IX

SUGGESTED ACTIVITIES

I. Instructor:
   - A. Provide students with objective sheets.
   - B. Provide each student with information sheets.
   - C. Make transparencies.
   - D. Discuss terminal and specific objectives with students.
   - E. Discuss information and assignment sheets.
   - F. Give test.

II. Students:
   - A. Read objectives.
   - B. Study information sheet.
   - C. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:
   - A. Objectives
   - B. Information sheets
   - C. Transparency masters
     - 1. TM 1 - Screeding and metal trowel
     - 2. TM 2 - Edging and jointing
     - 3. TM 3 - Types of finish
   - D. Test
   - E. Answers to test

II. References:
   - A. Agricultural Education Teaching Materials Center, Texas A & M, College Station, Texas, V C-3, Basic Voc Ag. II.
   - B. Quality Concrete, Hobar Publications, 1305 Tiller Lane, St. Paul, Minnesota. 55112.
   - C. Making Quality Concrete for Farm Construction, #PA055T, Portland Cement Association, Old Orchard Rd., Skokie Illinois. 60076.
   - D. Shinn, Glen C. and Curtis R. Weston, Working in Agricultural Mechanics, McGraw Hill, Inc. c. 1978.

PLACING, FINISHING, AND CURING CONCRETE
UNIT IX

ANSWERS TO TEST

1. a. 6
   b. 4
   c. 2
   d. 1
   e. 3
   f. 7
   g. 5
   h. 8

2. Any five of the following:
   1. Place concrete in forms as soon as possible after mixing.
   b. Place concrete where it is needed.
   c. Place in even layers about 6 to 8 inches deep and tamp well.
   d. Avoid dumping concrete against side of forms.
   e. Avoid letting the chute or buggy hit the side.
   f. Tamp and spade the concrete mixture thoroughly to prevent air pockets.
   g. Work the mixture against the side of the forms so the large aggregates will be forced away from the forms for a smooth surface.
   h. In all cases, procedures should be carried out to prevent water from collecting at the ends and corners of the forms.

3. Any five of the following:
   a. Concrete should be screeded as soon as it has been tamped or spaded in the forms.
   b. Finishing should be delayed until the surface is quite stiff but still workable.
   c. Surface water should be allowed to evaporate.
   d. Dry cement should not be sprinkled on top to remove moisture for finishing purposes, as this material will form a layer that is likely to develop hair line cracks.
   e. Edging and jointing follow the screeding operation.
   f. After the concrete is edged and jointed it should be floated.
   g. Trowel the concrete to bring a thick film of cement to the top.

4.

	Type	Use	Obtained By
a.	Gritty non-slipping	Walks, dairy barn floors	Using wood float
b.	Coarse, scored surface	Driveways, lots, ramps, feeding floors	Using a stiff broom
c.	Smooth, troweled finish	Table tops, feed troughs	Using steel trowel
d.	Pea grain	Porches and patios	Washing with water h

5. a. Curing should be started as early as possible and continued for at least seven days.

   b. Moisture curing greatly increases the strength of the concrete

6. a. Strength

   b. Durability

   c. Watertightness

7. a. Cover with straw, sand, wet burlap, or canvas as soon as possible without marring surface.

   b. Flood the surface and hold the water on the surface with some type of border around the edge of slab.